

RESEARCH ARTICLE

Parotid Gland Tumours in Turkish Population: Analysis of 165 Patients

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Abstract

Background: Retrospective data on 165 patients who presented with a parotid mass and underwent surgery in our clinics during 2000-2009 were examined. The obtained data (demographic data, surgical procedures, histopathological diagnoses) were compared to similar studies to make contributions to the literature. **Materials and Methods:** Patients were classified according to their histopathological diagnosis. Surgical procedures and patient follow-up were clarified. The results are presented as means and standard deviations. **Results:** Of the 165 masses, 134 (81.3%) were benign and 31 (18.7%) were malignant. Pleomorphic adenoma was the most common benign tumour (79 patients, 59%). Lymphoma and adenoid cystic carcinoma were equally common and were the most common malignant parotid gland tumours (both 6 patients, 19.3%). The most frequent surgical procedure was superficial parotidectomy (92 patients, 55.7%), and the most commonly encountered surgical complication was facial paralysis (12 patients, 7.2%). **Conclusions:** Our data are generally in line with the literature but lymphoma was more common than in most previous reports. Although the number of cases was low, the high incidence of parotid gland lymphoma was remarkable.

Keywords: Parotid neoplasms - surgery - postoperative complications

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Introduction

Salivary gland malignancies constitute 3-6% of the head and neck region malignancies and 0.3% of all malignancies (Kizil et al., 2013). According to different studies, 64-80% of salivary gland tumours are of parotid origin (Jafaari-Ashkavandi et al., 2013; Iqbal et al., 2014; Kaur et al., 2014; Torabinia et al., 2014). Approximately 80% of benign tumours that arise from the parotid gland are pleomorphic adenomas, and the second most common type of benign tumour is Warthin's tumour. The most frequently arising malignant tumour of parotid gland origin is mucoepidermoid carcinoma (Lopes et al., 1999). Metastatic masses are rare and often associated with cutaneous primary malignancies in the head and neck.

For all benign and malignant salivary gland tumours, basic treatment is surgical excision. Of course, tumor type, localization, and stage and grade of a malignant tumour affect extent of a surgery.

In this study we aimed that the incidence of pathologies, female to male ratio, age distribution, surgical methods, and surgical complications in parotid masses were to be evaluated, and the results were compared to similar studies to contribute to knowledge on this subject.

Materials and Methods

A total of 165 patients with available data who underwent parotidectomy because of a mass in the parotid in Kocaeli University Faculty of Medicine in the Department of Otorhinolaryngology between 2000 and 2009 were included. Patient data were retrospectively examined, and the incidence of pathology, female to male ratio, age distribution, surgical techniques, and surgical complications were recorded. The study was approved by the ethics committee of Kocaeli University Human Research Centre (project number 2009/110).

Patients with pathologic diagnoses of benign and malignant tumours were evaluated. Parotid ultrasonography, magnetic resonance imaging, and fine needle aspiration biopsy (FNAB) were used, and routine laboratory tests were performed according to a preoperative protocol. Histopathological reports on surgical specimens and the findings on tumour type, surgical margins, and perineural invasion were evaluated. Patients with malignant pathology were followed every 2 months in the first postoperative year, every 3 months in the second year, and then every 6 months and annually thereafter, and data were obtained according to this schedule. Imaging

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methods were also used in the follow-up of patients with malignant pathology. All of the statistical analyses were performed with SPSS version 10.0.

Results

The pathology and sex distribution of the 165 patients are shown in Table 1. Patients with benign and malignant pathology usually presented to our clinic with complaints of swelling in the parotid lobe. The mean age of patients with benign tumours was 44.7 years (± 15), and the mean age of those with malignant tumours was 57.3 years (± 19.4). Pathology groups and age ranges of the patients are presented in Table 2. Benign tumours were most common between the ages of 40 and 60, whereas malignant tumours were more common in patients older than 60. The most common pathological diagnosis among benign parotid masses was pleomorphic adenoma (59%), followed by Warthin's tumour (21.9%). Next, respectively, basal cell adenoma (5 patients, 3.7%), myoepithelioma (4 patients, 3%), and lipoma (4 patients, 3%) were detected. There were 13 cases with other pathologies: Sjogren's syndrome, benign angiomatosis development, Castleman's disease, epidermal cyst, monomorphic adenoma, granulation tissue (two cases), canalicular adenoma, cystic lymphangioma, histiocytic infiltration, vascular dysplasia, fibromatosis, and lymphoid hyperplasia (Table 3).

Table 1. Parotid Pathology by Gender

Sex	Malignant (%)	Benign (%)	Total (%)
Male	16 (51.6%)	68 (50.7%)	84 (50.9%)
Female	15 (48.4%)	66 (49.3%)	81 (49.1%)
Total	31 (18.7%)	134 (81.3%)	165 (100%)

Table 2. Pathology Groups and Age Ranges

Age range	Benign (%)	Malignant (%)	Total (%)
<20 years	10 (7.4%)	1 (3.1%)	11 (6.6%)
20–40 years	41 (30.5%)	7 (21.8%)	48 (28.9%)
40–60 years	62 (46.2%)	9 (31.2%)	72 (43.3%)
> 60 years	21 (15.6%)	14 (43.7%)	35 (21%)
Total	134	31	165

Table 3. Distribution of Parotid Gland Tumours

Histopathology	n	%
Benign lesions		
Pleomorphic Adenoma	79	59.0
Warthin	29	21.9
Basal Cell Adenoma	5	3.7
Myoepithelioma	4	3.0
Lipoma	4	3.0
Others	13	9.4
Malign lesions		
Lymphoma	6	19.3
Adenoid Cystic Carcinoma	6	19.3
Acinic Cell Carcinoma	5	16.1
Squamous Cell Carcinoma	5	16.1
Malign Melanoma	3	9.6
Mucoepidermoid Carcinoma	2	6.4
Ductal Carcinoma	2	6.4
Basal Cell Carcinoma	1	3.2
Adenocarcinoma	1	3.2

Among malignant tumours, lymphoma and adenoid cystic carcinoma were the most malignant parotid mass and they were at same frequency (Table 3). Ten patients with malignant pathology did not return for follow-up. Total parotidectomy was performed on 15 patients, expanded total parotidectomy on 3 patients, superficial parotidectomy on 11 patients, enucleation on 1 patient, and incisional biopsy on 1 patient.

The most frequently performed parotidectomy procedure was superficial parotidectomy (92 patients, 55.8%). Total parotidectomy was performed in 26 patients (15.7%), mainly those with malignant pathologies. Partial superficial parotidectomy, which is currently preferred for benign lesions, was performed on 37 patients (22.4%). Incisional biopsy was performed on one patient whose parotid tissue was diffusely infiltrative after the surgical area was exposed; the patient was diagnosed with lymphoma pathologically. During parotid surgery in our clinic, a facial nerve stimulator was used in each case. Neck dissection was performed on 17 malignant patients. In the preoperative imaging of the neck, the dissection decision was based on the presence of metastatic lymphadenopathies.

Facial paralysis was observed in 12 patients (7.27%) (if mass locate in deep lobe or diffuse involvement exists, the probability of occurrence of facial paralysis increases). Of all facial paralysis, three patients in malignant group was observed transient facial paralysis. Eight patients with malignant group and in 1 patient in benign group were observed permanent facial paralysis. When patients were questioned for the purpose of retrospective scanning, Frey's syndrome was observed in 10 cases. No case was re-operated on because of these complications.

Discussion

Generally, 80% of tumours of the parotid gland are benign (Bussu et al., 2014). Malignant tumours tend to occur in older patients. The average age for malignant salivary gland neoplasms is 55, whereas it is 45 for benign tumours (Ito et al., 2005).

Our study had a male predominance of 51.6% in the malignant pathology group and 50.7% in the benign pathology group. Although we reviewed a limited number of cases, our results are in accordance with the literature (Kowalski et al., 2009, Gunizi et al., 2013).

The main complaint of patients with parotid gland tumours is swelling in the parotid region and below the earlobe. About 50% of patients present with this symptom. Patients with malignant tumours may also present with a slowly growing, mobile, painless mass. The other half of the patients may present with facial paralysis, pain, trismus, tumour fixation, skin involvement, and even tumour fistulisation, which may alert the clinician to malignancies (Spiro et al., 1986; Przewozny et al., 2004). In our series, the most common complaint at presentation was swelling in the parotid area in the benign neoplasm group. Among patients with benign neoplasms, 24.6% had pain, a non-negligible value. This rate increased to 37% in the malignant group. Significant differences were detected between the malignant and benign groups in terms of pain

(Fischer exact test, $p=0.046$). The most common symptom in the malignant pathology group was swelling in the parotid area; 63% of the patients did not report pain. This may reflect the high numbers of lymphoma and acinic cell carcinoma patients (11 cases). In addition, in accordance with the literature, facial palsy, tumour fixation, and skin involvement were among the symptoms in the malignant pathology group.

Compatible with the literature, we also found that pleomorphic adenoma (59%) and Warthin's tumour (21.9%) were the most frequent benign tumours (Kizil et al., 2013, Gunizi et al., 2013), and Warthin's tumour was frequent (77.1%) in male patients. There is an established relationship between Warthin's tumour and cigarette smoking. The frequency of cigarette smoking in patients with this type of tumour varies from 79% to 100% in different series. In our series, 82.7% of such patients were cigarette smokers.

Mucoepidermoid carcinoma reported the most frequently in a series of malignant parotid gland tumours that also included adenocarcinoma, acinic cell carcinoma, adenoid cystic carcinoma, and carcinoma ex pleomorphic adenoma (Walberg et al., 2002; Ito et al., 2005; Kizil et al. 2013; Iqbal et al., 2014). Our series had a different distribution from the literature. Adenoid cystic carcinoma and lymphoma were the most common malignancies. The rest were acinic cell carcinoma, squamous cell carcinoma, metastases from malignant melanoma, mucoepidermoid carcinoma, ductal carcinoma, basal cell carcinoma, and adenocarcinoma. We did not see a case of malignant transition of pleomorphic adenoma. This may have been due to the small patient number.

Mucoepidermoid carcinomas are classified as low-, medium-, and high-grade carcinomas. Patients with high-grade tumours should have radiotherapy as well as parotidectomy (Emerick et al., 2007).

Adenoid cystic carcinomas account for 10-15% of malignant parotid tumours (Tewari et al., 2013). Late local and systemic metastasis is an important feature of adenoid cystic carcinomas (Spiro et al., 1997). Umeda (Umeda et al., 1999) reported pulmonary metastasis in 70% of patients in a 5-year follow-up regardless of T grading; postoperative radiotherapy in addition to surgical treatment significantly reduced the rate of locoregional metastasis in adenoid cystic carcinoma. The facial nerve should be preserved perioperatively if its functions are normal preoperatively. Moreover, in comparative studies on patients with normal facial nerve function preoperatively, nerve sacrifice did not have positive effects on survival (Casler et al., 1992). In our series, adenoid cystic carcinomas accounted for 19.3% of the malignant pathology group. Among the patients who were followed up, locoregional relapse was not observed. Cervical metastasis was seen in two cases. Adjuvant RT was administered to nearly all of the patients. Another common malignancy was lymphoma, with six patients. These cases were treated by the medical oncology department.

Another common malignancy was acinic cell carcinoma, with five cases. None had metastatic lymph nodes. The longest follow-up period was 113 months. That patient had relapse in the parotid site after 6 years

and underwent further surgery. He did not have additional relapses in his third postoperative year. Another case was a 61-year-old man. He had swelling in the parotid region for 6 years. Although he had normal facial nerve function, his preoperative evaluation revealed that his facial nerve trunk was surrounded by tumour tissue. A parotidectomy was performed, leaving macroscopic tumour tissue around the nerve. He was treated with radiotherapy for the residual tumour.

The parotid gland is a possible target area for malignancies of the neck, head, and skin. Therefore, facial nerve sacrifice is recommended in metastatic parotid tumours, even if the nerve has normal function. This is different from the practice of facial nerve management in primary parotid tumours. Moreover, cervical dissection is essential to provide locoregional control. Postoperative radiotherapy is applied as adjuvant therapy for palliative treatment (Raut et al., 2004). Primary squamous cell carcinoma of the parotid gland is rare. In our series, there were three patients with malignant melanoma metastasis and five patients with squamous cell carcinoma metastasis, all of whom underwent cervical lymph node dissection. Five patients were given postoperative radiotherapy (one patient with malignant melanoma had been given radiotherapy for head and neck cancer previously). Cervical metastasis was detected in six cases.

The complications of patients undergoing parotid surgery include damage to the facial nerve, bleeding, hematoma, seroma, sialocele, flap necrosis, fistula of the salivary gland, infection, and Frey's syndrome. The incidence of facial nerve damage increases in deep lobe tumours and total parotidectomy. Preoperative facial nerve function and preoperative pathology are important markers in facial nerve sacrifice. Therefore, many surgeons monitor the facial nerve to protect it from damage (Reilly et al., 2003). Haemostasis and adequate drainage of the operation site preclude complications such as hematoma and seroma. Adequate drainage of the operation site and the use of a medical compress would prevent salivary fistula.

With this study, we presented epidemiological, clinical and histopathological characteristics of parotid mass in Turkish population and compared with other studies. Consequently, partial superficial or superficial parotidectomy is an adequate treatment regimen for benign parotid tumours. Superficial or total parotidectomy is applied in malignant tumours. In patients with concomitant cervical masses and in cases of possible metastasis to the neck (after confirming the metastasis), cervical dissection should be performed. In patients with preoperative impaired facial nerve function, the facial nerve should be sacrificed. A clear surgical margin is crucial for survival in metastatic cases. Postoperative radiotherapy or chemotherapy should be added to the treatment strategy in accordance with the results of the pathological examination. The patients should be informed about any possible complications preoperatively.

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