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Clinical results of surgical treatment in parotid tumors

Abstract

Objective: In this study, we aimed to evaluate clinical presentations, histopathological diagnosis, surgical treatment modalities and complications of patients operated for a parotid gland mass.

Methods: Medical records of 100 patients who were operated for a parotid gland mass between 2010 and 2016 years evaluated retrospectively.

Results and discussion: 49 (49%) of these patients were female and 51 (51%) were male. The mean age of the patients was 47.9. Post-operative histopathologic assessement, 89 of the cases were found to be primary benign, 7 of the cases primary malignant and 4 of the cases secondary malignant. For benign tumors the most common histopathology was pleomorphic adenoma in 45 (45%) patients, and the second was whartin tumor in 32 (32%) patients. Mucoepidermoid carsinoma was seen as the most common primary malign tumor (3 patients). All cases with primary malignancy continue to follow-up visits and the average follow-up period is 37months. However, all of the cases with secondary malignant parotid tumors were died due to malignancy. Complication ratio was 12% and facial paresis was the most common complication.

Conclusion: Subtotal parotidectomy is an adequate and efficient surgical procedure for the benign parotid tumors and complication risk is considerably low when applied carefully. However it may be required complementary total parotidectomy for malignant tumors. The prognosis is very good especially for the primary malign parotid tumors. However, it is not satisfactory for the secondary malign tumors.

Keywords: parotid tumors, histopathology, surgery, salivary gland tumors, mucoepidermoid carcinoma

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Abbrevaitions: USG, ultrasonography; MRI, magnetic resonance imaging; CT, computed tomography; FNA, fine needle aspiration

Introduction

Parotid tumors, which account for 2-3% of all head and neck tumors, occur at a frequency of 1/100,000 and constitute up to 80% of all salivary gland tumors.[1–3] Of all the salivary gland tumors, 75% of them are benign and 25% of them are malignant. About 20-25% of the parotid gland, 40% of the submandibulary gland, and 90% of sublingual gland tumors are malignant.[4] According to the histological classification of the World Health Organization in 1991, salivary gland tumors were divided into more than 30 histological subtypes. The most common benign parotid masses are; pleomorphic adenoma and wharthin tumor, the most common malignant tumor is mucoepidermoid carcinoma.[5] Whereas the most common malignant tumors of the submandibular and minor salivary gland are adenoid cystic carcinoma.[5]

The most frequent initial symptom of the parotid gland tumors are swelling at the anterior and inferior part of auricula. The treatment modalities can be decided after the diagnostic procedures such as ultrasonography (USG), magnetic resonance imaging (MRI), computed tomography (CT) and fine needle aspiration (FNA). In this study, we aimed to evaluate clinical presentations, histopathological diagnosis, surgical treatment modalities, follow-up periods, and complications of patients operated for a parotid gland mass.

Material and methods

In this study, we reviewed the current literature and performed a retrospective study of 100 patients which were operated for parotid masses in Sakarya University Training and Research Hospital between 2010 and 2016, by database analysis. Ouantitative and qualitative data such as; age, gender, follow-up period, symptoms, initial physical examination findings, selected surgical technique, histopathological diagnosis, and post-operative complications were recorded.

The patients were classified for initial examination findings as; incidental mass, incidental lesion in imaging exams, local pain and inflamation. Regarding the pre-operative examination, fine needle aspiration was performed for the cases. FNA was evaluated for the groups as follows: benign, malignant, and cytologically non-classified lesions. One or more of the radiological exams such as ultrasonography, computed tomography and magnetic resonance imaging were performed for the patients before the surgery. As for surgical technique, the operations were classified as; total, subtotal, and radical parotidectomy. In patients with palpable lymphadenopathy and high risk for occult metastases, neck dissection was also performed. The cytologic results of pre-operative FNA were compared with the final histopathologic results in terms of correlation. The complications of the surgery were classified as; temporary facial paralysis, permanent facial paralysis, seroma, and Frey syndrome.

The data were analyzed using SPSS program. Descriptive statistics and the chi-square test was used for the analysis. P-values smaller than 0.05 were considered statistically significant.

Results and discussion

Benign parotid tumors generally have clinical signs as painless, well-defined masses with slow growth. Whereas rapid growth, restricted mobility, fixity of overlying skin, pain and facial nerve involvement indicate the possibility of tumor being malignant.[7] Mass palpation at the anterior and inferior part of auricula was the main manifestation at physical examination in the study population, in 92%, in agreement with the literature. Only few cases were presented with local inflamation and pain at the parotid gland topography.

In the current literature, it is known that parotid tumors are seen between the fourth and sixth decades and there is no clear opinion for gender predominancy for benign parotid tumors.[7,8] However, a male preponderance is shown for malign salivary gland tumors.[4] In the present study, a total number of 100 patients with parotid gland masses were investigated and there were 49 (49%) female and 51 (51%) male patients. Median age was 47.9±16.6 (range 7-88)years (56,8±17.9 for malign group, 47.8±16.4 for benign group). Benign tumors were about 92% in female and 86% in male group. Additionally, malign tumors were about 36,3% in female group and 63.7% in males. The association between the tumor characteristic and gender was not statistically significant (p>0,05).

The data of the present study showed that, benign lesions constitute 89% of the study group. The most frequent parotid tumor was pleomorphic adenoma which was constituted 45% of the whole group. The second most frequent benign parotid tumor was warthin tumor with a percentage of 32%. Primary and secondary malignant tumors constituted 7% and 4% of the whole group and the most frequent primary malignant tumor was mucoepidermoid carcinoma (Table 1). Although the ratio of the malign tumors is less than the literature data, tumor distribution of the study is compatible with the literature.[1] This results can be explained by the small number of study group.

Before surgery, stage must be defined by clinical examination and contrast enhanced CT scans or MRI of the head and neck. In the presence of a suspicion for malignancy, it must be completed with imaging of the lungs In the present study; only one patient were in stage I, three were in stage II, and two were in stage III in the primary parotid tumors. The patient with Large B cell Lymphoma was in stage IE. None of the patients had stage IV disease. One patient with carcinoma ex-pleomorphic adenoma was N2a. There was not any metastatic tumor in our serius. Fine needle aspiration cytology was performed 86% of the cases. According to the results of this assessments; 58% were benign, as opposed 8% malignant and 20% cytologically non-classified lesions. Comparing them with the definite post-operative histopathological results showed a sensitivity of 72% to identify cases of malignancy and specificity of 100%, without any false positive case. Although the specificity ratio was higher than the literature, our sensitivity rates were lower when it was compared with the other studies.[1,9] Either the higher sensitivity and lower specificity rates can be explained with the high rate of the patients with cytologically non-classified lesions.

Surgical approaches are the main treatment modalities for the parotid gland tumors and the most minimal invasive surgical technique is subtotal parotidectomy for most of the surgeons. Total parotidectomy should only be preferred for tumors that involve the deep part of the parotid gland and for high grade malignant tumors of the parotid.[7] Recently, an extracapsular dissection technique has been described as an alternative for removing the benign superficial tumors smaller than 4-cm with similar or improved recurrence and decreased morbidity rates.[10,11] In the present study, subtotal (81%) or total (18%) parotidectomy was preferred for the tumors with benign cytological and radiological features according to their anatomic location in the parotid gland. However, if the pre-operative diagnosis was in favor of malignant tumor, we performed total parotidectomy for the cases. Radical parotidectomy with facial nerve sacrifiation was performed for only one patient.

Radical surgery with the complete removal the parotid gland and the tumor with adequate margins is the main treatment modality for the parotid malign tumors. However, for the tumors with; deep lobe settlement, high grade histopathology, ≥4cm, positive surgical margin, lymph node metastases, soft tissue or bone infiltration, perivascular and perineural invasion, lymphovascular invasion, locally advanced stage and recurrent carcinoma a combined treatment modality with surgery followed by post-operative radiotherapy is recommended. Chemotherapy may only be chosen for metastatic cases.[4] In addition, in patients with high grade malignant histopathological features and/or clinical positive regional lymph node metastasis neck dissection must be added to the parotidectomy. However, clinical N0 tumors may be treated without neck dissection.[12] According to our results, total parotidectomy was performed to all of the patients with malignant histopathology. Six patients (55%) underwent functional neck dissection, four (36%) patients had surgical treatment followed by radiotherapy. Three patients with subtotal parotidectomy required complementary total parotidectomy. The patient with large B-cell lymphoma received chemotherapy. All of the cases with primary malignant tumors are followed without disease and the average follow-up period for these patients is 37months. However, all of the patients with secondary malignant parotid tumors were died during follow-up period (Table 2).

Table 1 Classification of the cases according to pathological diagnosis

Primary Benign	n	Primary Malignant	n	Secondary Malignant	n
Pleomorphic adenoma	45	Mucoepidermoid carcinoma	3	Squamous cell carcinoma	3
Warthin Tumor	32	Adenocarcinoma	1	Sebaceous carcinoma	1
Basal cell adenoma	2	Carcinoma ex pleomorphic adenoma	1		
Lipoma	2	Adenoid cystic carcinoma	1		
Lymphadenitis	4	Large B cell Lymphoma	1		
Retention cysts	1				
Myoepithelioma	1				
Cystadenoma	1				
Lymphangioma	1				

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Table 2 Histopathological diagnosis, treatment and follow-up of the malignant tumors

Age/Gender	Histopathological Type	Treatment	Recurrence	Metastasis	Follow-up Time (Month)
30/F	Adenoid cystic carcinoma	TP+RT	-	-	18
53/F	Mucoepidermoid carcinoma	StP+cTP+RT	-	-	60
74/M	Mucoepidermoid carcinoma	TP+ND	-	-	36
43/M	Mucoepidermoid carcinoma	TP+ND	-	-	19
50/M	Adenocarcinoma	TP+RT	-	+	48
62/M	Sebaceous carcinoma	TP+ND	-	+	24 (excitus)
88/M	Squamous cell carcinoma	TP+ND	-	+	12 (excitus)
73/F	Squamous cell carcinoma	TP+ND	-	+	12 (excitus)
54/F	Squamous cell carcinoma	StP+cTP+ND	-	-	24 (excitus)
66/M	Carcinoma ex pleomorphic adenoma	StP+RT+cTP	-	-	19
32/M	Large B cell Lymphoma	StP+CT	-		36

TP: Total Parotidectomy; RT: Radiotherapy; StP: Subtotal Parotidectomy; cTP: Complementary Total Parotidectomy; ND: Neck Dissection; CT: Chemotherapy

The most feared complication of the parotid surgery for both patients and the surgical team is facial paralysis. Transient facial palsy remains the most common complication and permanent palsy is seen in 0-19% of the cases. Diameter and depth of the tumor and surgery for recurrent tumor were described as risk factors for facial paralysis.[13] As in the literature the most frequent complication for our cases is transient facial paralysis with a percentage of 8%. Five of them (%5,6) were in the patients with benign tumors and 3 cases (27%) in the malign group. Only two of our patients had permanent facial paralysis. One of them was the patient who underwent radical parotidectomy with facial nerve sacrification and the other one was a patient who underwent complementary total parotidectomy. Apart from these, three seroma cases (1 case in the patients with malignant tumors and two in the benign group) and a patient with Frey syndrome in malignant group were recorded.

Conclusion

Subtotal parotidectomy is an adequate and efficient surgical procedure for the benign parotid tumors and complication risk is considerably low when applied carefully. However it may be required complementary total parotidectomy for malignant tumors, When necessary, neck dissection and postoperative radiotherapy should be added to the treatment. Although the prognosis is very good especially for the primary malign tumors, it is not satisfactory for the secondary malign tumors.

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Conflicts of interest

Author declares there are no conflicts of interest.

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