

# A Retrospective Study on Clinico-Pathological Presentations and Complications of Parotidectomy

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## ABSTRACT

### Introduction

Salivary gland tumors are rarely seen. It constitutes approximately 3% of all head-neck tumors. 75-80% of these tumors originate from the parotid gland. In this study, 98 patients who underwent parotidectomy in a tertiary otorhinolaryngology clinic were analyzed retrospectively, the frequency of different pathologies and our treatment modalities for parotid masses are presented in the light of current literature.

### Materials and Methods

In this study, 98 patients who underwent parotidectomy in our clinic between 2011 and 2018 were retrospectively analyzed, the frequency of different pathologies, our treatment approach, and complications of treatment for parotid masses are presented in the light of current literature.

### Results

The mean age was 48 years (between the range of 7-82 years). 41 cases were female and 57 cases were male. In the results of FNAB, there were 65 (66%) benign cases, 28 (29%) malignancy suspects and 5 (5%) malignant cases, 68 (69%) benign cases, and 30 (31%) malignant cases in surgical pathologies. The most frequent lesion of all parotid masses was pleomorphic adenoma (24%). The most common benign lesion was pleomorphic adenoma (35%) and the most frequent malignant tumor was mucoepidermoid carcinoma (27%). The most common surgery type was superficial parotidectomy (82 cases). The most common complication was marginal mandibular nerve paresis (6).

### Conclusion

The treatment modality of the parotid tumors varies from case to case according to the nature of the tumor and extension.

### Keywords

Parotid Gland; Parotidectomy; Pleomorphic Adenoma

Salivary gland tumors arise most commonly (85%) from the parotid gland. The most frequent benign tumor of the parotid gland is a pleomorphic adenoma. Mucoepidermoid carcinoma is the most common malignant tumor.<sup>1,2</sup> For parotid tumors, the main symptom is mass in the preauricular region, other symptoms are pain, facial paralysis, and skin ulcer, especially in malignant tumors.<sup>3</sup> The treatment modality for these tumors is superficial or total parotidectomy depending on tumor extension and preoperative fine-needle aspiration cytology (FNAC) results.<sup>4,7</sup> In this study, 98 patients who underwent parotidectomy in a tertiary otorhinolaryngology clinic were analyzed retrospectively, the frequency of different pathologies,

our treatment modalities, and complications of treatment for parotid masses are presented in the light of current literature.

## Materials and Methods

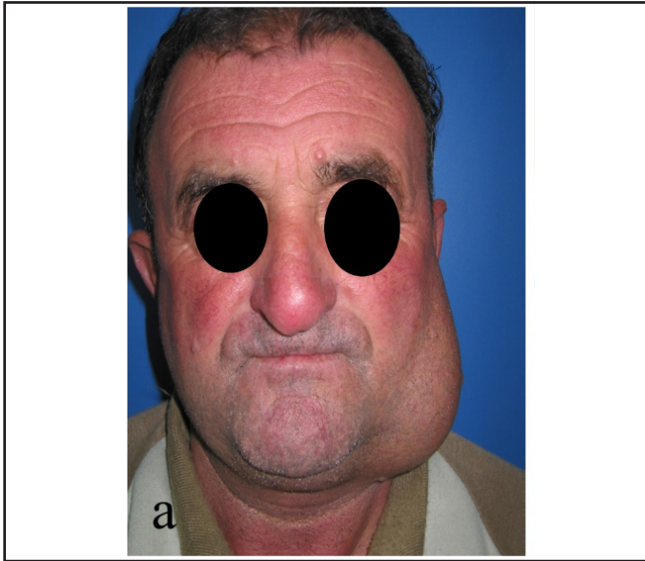
Patients who underwent parotid surgery in a tertiary

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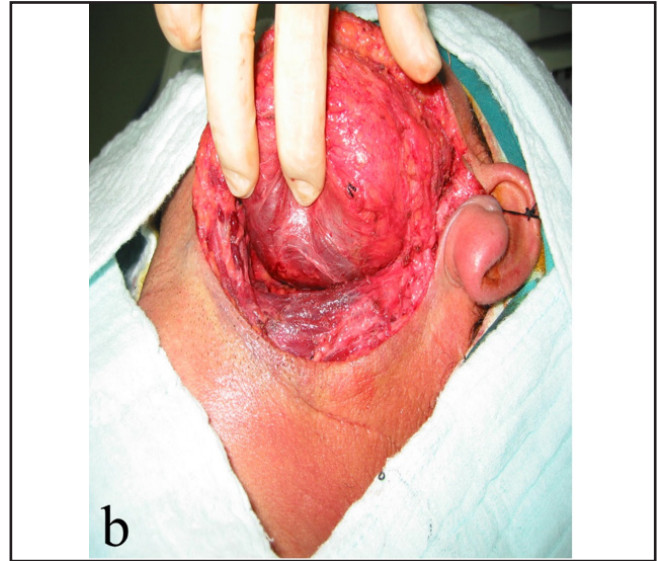
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**Fig. 1a.** Image of mass on the neck



**Fig. 1b.** Intraoperative image of mass (Warthin tumour)

otorhinolaryngology clinic, between 2011 and 2018 were analyzed retrospectively. The anamnesis and examination findings of the subjects were reviewed. Before surgery, appropriate radiological examinations (ultrasonography, computerized tomography, or magnetic resonance imaging) and fine-needle aspiration cytology (FNAC) of all patients were performed. For treatment, superficial or total parotidectomy was performed according to cytological examination. Intraoperative facial nerve monitoring was performed in all patients. Monitoring was performed with a NIM-Pulse dual-channel electromyography (EMG) device (NIMPulse 2.0; Medtronic Xomed, Jacksonville, FL, USA).

Age, gender, side of the mass, whether the mass involves the deep lobe, preoperative FNAC result, postoperative histopathology results, and complications were noted. All patients who underwent parotidectomy among the specified time range were included in the study. Patients who we operated on for sialolithiasis and whose records that we could not reach properly were excluded.

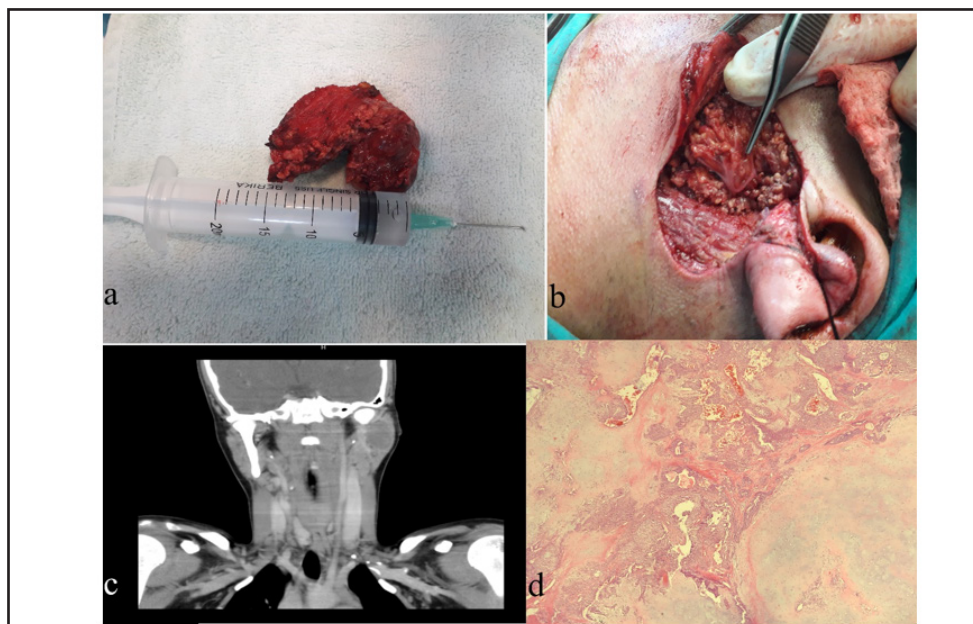
## Results

Ninety-eight patients were included in this study. The primary complaint of the patients was a mass in the

neck. (Fig. 1) The mean age was  $47.64 \pm 15.8$  (7-82) years. Forty-one cases were female and 57 cases were male. The tumor was on the right side in 45 (46%) of the patients and on the left side in 53 (54%). Twenty-eight (30%) patients had a tumor in the deep lobe of the parotid or extending into the deep lobe. Seventy of the masses were arising from the superficial lobe.

According to FNAC results, there were 65 (66%) benign cases, 28 (29%) malignancy suspected cases, and 5 (5%) malign cases. Postoperative histopathological results were 68 (69%) benign cases and 30 (31%) malignant cases. Although FNAB results were suspected as malignancy in three patients, the postoperative pathological evaluation was benign. The most common lesion in all parotid masses was pleomorphic adenoma (24%). (Fig. 2) The most common benign lesion was pleomorphic adenoma (35%) and the most common malignant tumor was mucoepidermoid carcinoma (27%). (Table I)

The most common surgery was superficial parotidectomy (82 cases). Among these 82 cases, 6 patients underwent superficial parotidectomy together with simultaneous neck dissection due to low-grade malignancy. Total parotidectomy together with simultaneous neck dissection was performed in 8 patients operated on for malignancy. Four patients who had pleomorphic adenomas and two patients who had



**Fig. 2a. Specimen of pleomorphic adenoma Fig. 2b. Intraoperative image of parotidectomy indicating the trunk of the facial nerve Fig. 2c. CT image of mass Fig. 2d. Typical histological view of pleomorphic adenoma; chondromyxoid stroma, epithelial and myoepithelial cell layers (H&E x40)**

Warthin tumors underwent total parotidectomy due to deep lobe extension. Radical parotidectomy was performed in 1 malignant patient with perioperative facial nerve invasion and 1 patient with schwannoma originating from the facial nerve trunk. (Table II)

The most common complication in our patients undergoing parotidectomy was marginal mandibular nerve paresis (6 cases). Buccal branch paresis was observed in 5 patients. The surgery performed in 9 of 11 patients who developed paresis was total parotidectomy. All patients completely recovered in the follow-up period. Two patients undergoing radical parotidectomy had permanent facial paralysis despite graft repair. The salivary fistula was observed in 1 patient, seroma in 2 patients, and hematoma in 3 patients and improvement in these complications was achieved with printed dressings. (Table III)

### Discussion

Salivary gland tumors constitute 3% of all tumors in the body and 5 to 10% of tumors seen in the head and neck region. Tumors originating from the salivary gland are

seen equally in men and women, and the period between the ages of 20 and 60 years is the most common. Most of these tumors (75-80%) originate from the parotid gland.<sup>8</sup> The most common benign tumor is a pleomorphic adenoma, and the second most common benign tumor is the Warthin tumor.<sup>9,10</sup> In our study, benign tumors were more with 69%, and the most common result was pleomorphic adenoma. The second most common benign tumor was the Warthin tumor. Malignant tumors were 31%, and the most common pathological type was mucoepidermoid carcinoma. Our benign and malignant lesions frequently seen in the parotid were compatible with the literature.

Parotid gland tumors are more common in men than in women.<sup>10-11</sup> In parotid salivary gland tumors, benign lesions are mostly seen in the 5th decade of life and malignant lesions in the 6th decade of life.<sup>12</sup> In our study, the mean age of patients was 48 years (between the range of 7-82 years). Forty-one (42%) patients were female and fifty-seven (58%) patients were male.

The parotid gland is surgically divided into superficial and deep lobes. This distinction is made according to the facial nerve, which emerges from the stylomastoid

**Table I: Distribution of patients according to benign and malignant parotid tumors**

BENIGN PATHOLOGICAL DIAGNOSIS	NUMBER OF PATIENTS
Pleomorphic adenoma	24
Warthin tumor	22
Chronic sialadenitis	9
Chronic granulomatous inflammation	7
Schwannoma	2
Lipoma	1
Basal cell adenoma	1
Oncosytoma	1
Monomorphic adenoma	1
Total	68
MALIGNANT PATHOLOGICAL DIAGNOSIS	NUMBER OF PATIENTS
Mucoepidermoid carcinoma	8
Acinic cell carcinoma	6
Diffuse B cell lymphoma	4
Squamous cell carcinoma	4
Adenoid cystic carcinoma	4
Adenocarcinoma	4
Total	30

foramen and travels through the parotid gland. The superficial lobe is closely related to the skin, while the deep lobe forms a small part of the parotid. 90% of the parotid gland tumors originate from the superficial lobe and 10% from the deep lobe.<sup>13</sup> Following the literature, in our study, 28 (30%) patients had deep lobe placement

or deep lobe extension. Seventy of the masses were located in the superficial lobe.

Superficial parotidectomy is the most preferred surgery in parotid benign tumors and is generally preferred for patients limited in the superficial lobe. Total parotidectomy is generally preferred in malignant parotid tumors.<sup>14</sup> Total parotidectomy can also be performed in some deep lobe benign tumors. Neck dissection should be added to surgery due to the risk of cervical metastasis in malignant parotid gland tumors.<sup>15</sup> In the literature, it has been reported that superficial parotidectomy is adequate in malignant tumors with low grade, for tumors limited in the superficial lobe and lateral to the facial nerve.<sup>9</sup> Superficial parotidectomy was the most commonly applied surgery in our clinic (82 cases). Six patients underwent superficial

**Table II: Distribution of patients according to surgical methods applied**

SURGERY	NUMBER OF PATIENTS
Superficial parotidectomy	82
Total parotidectomy	14
Radical parotidectomy	2

Table III: Distribution of patients according to postoperative complications

COMPLICATIONS	SUPERFICIAL PAROTIDECTOMY	TOTAL PAROTIDECTOMY	RADICAL PAROTIDECTOMY
Marginal mandibular nerve paresis	1	5	
Buccal branch nerve paresis	1	4	
Facial paralysis			2
Salivary fistula		1	
Seroma		2	
Hematoma	1	1	1

parotidectomy and neck dissection together due to low-grade malignancy. Total parotidectomy together with simultaneous neck dissection was performed in 8 patients operated on for malignancy. Four patients who had pleomorphic adenomas and two patients who had whartin tumors underwent total parotidectomy due to deep lobe extension.

In parotid surgery, a correct preoperative histopathological evaluation is important for determining the extent of the surgery, whether important structures such as the facial nerve will be sacrificed, whether neck

dissection will be added to the surgery, or if the patient is in a position that can't be removed by surgery and if the tumor is benign. It was stated that FNAB had a crucial role in the preoperative evaluation.<sup>16,17</sup>

Complications that may occur in patients undergoing parotid surgery are facial nerve injuries, bleeding, hematoma, seroma, sialocele, infection, salivary gland fistula, and Frey syndrome. Also, the intra-operative opening of the pseudocapsule of pleomorphic adenomas is traditionally held to increase the risk of recurrence. The main reason for pleomorphic adenoma recurrence is

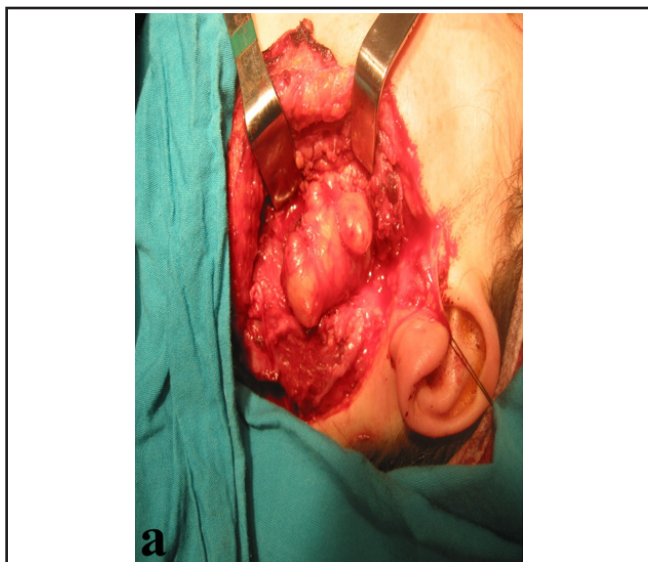


Fig. 3a. Schwannoma of facial nerve extending to the deep lobe of parotid

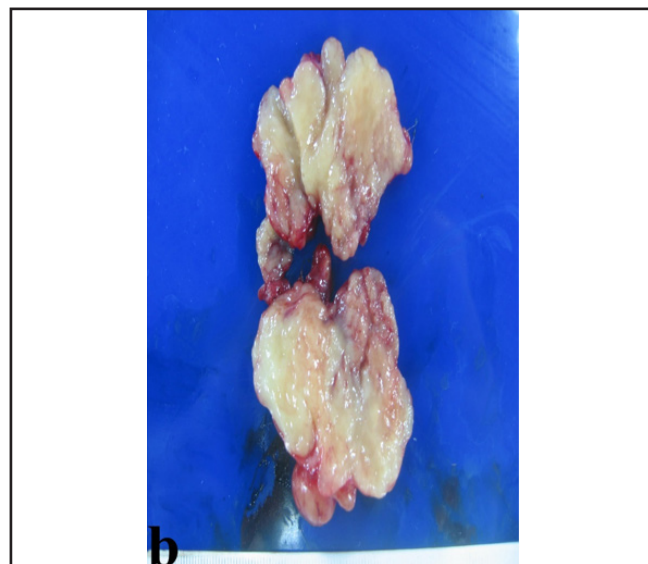


Fig. 3b. Cut surface of Schwannoma

incomplete surgical resection. An amputation neuroma of the greater auricular nerve can occur the following parotidectomy and can be managed by simple excision. The 'surgical depression' caused by the removal of the parotid gland is most noticeable immediately after the operation, when the surrounding skin is slightly oedematous, enhancing the contrast. This depression also decreases with time but does not disappear entirely. The magnitude of this depression depends on the amount of gland removed. Mild trismus may be related to inflammation and fibrosis of the masseter muscle. This complication is usually mild and transient and improves with jaw-opening exercises. Hypoesthesia of the greater auricular nerve is a frequent consequence of parotidectomy. Patients are told that they will feel numbness around the ear, especially at the lobule. The area of numbness will improve within one year of the operation but a small area of skin may remain anesthetized.<sup>18,19</sup>

To reduce the risk of facial nerve damage, intraoperative facial nerve monitoring utilization can be very useful.<sup>20</sup> In our study, intraoperative facial nerve monitoring was performed in all surgeries.

In their prospective study of 20 cases, Öztürk et al. found that 8 of the 20 patients (40%) who underwent superficial parotidectomy had temporary paresis of the marginal mandibular (MM) branch of the facial nerve and reported that they completely recovered during follow-up.<sup>20</sup> Saliva fistula can also be seen after superficial parotidectomy and can be corrected with printed dressing.<sup>21</sup> In our study, the most common complication in our patients undergoing parotidectomy was marginal mandibular nerve paresis (6 cases). Buccal branch paresis was seen in 5 patients. The surgery performed in 9 of 11 patients who developed paresis was total parotidectomy. All patients completely recovered in the follow-up period. Two patients undergoing radical parotidectomy had permanent facial paralysis despite graft repair. The salivary fistula was noted in 1 patient, seroma in 2 patients, and hematoma in 3 patients, and improvement in these complications was achieved with proper dressings. These results show that superficial parotidectomy is an adequate surgical option in benign parotid tumors.

## Conclusion

Most of the parotid tumors were benign (pleomorphic adenoma most commonly). The preferred treatment modality was often superficial parotidectomy. Preoperative histopathological sampling has a crucial role in planning the surgery. Using intraoperative facial nerve monitoring gives the surgeon a sense of confidence during the operation. The findings were compatible with the literature.

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