Features of Parotid Gland Diseases and Surgical Results in Southern Taiwan

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Various parotid gland diseases are seen clinically, including inflammation, sialolithiasis, and benign and malignant tumors. It is important to differentiate between these to make a correct diagnosis and for proper management. Here, we investigated the relationship between tumor characteristics and pathology, and considered whether the former could be used to differentiate malignant from benign parotid gland diseases. We retrospectively reviewed the charts and data of 316 patients who underwent surgery in Kaohsiung Medical University Chung-Ho Memorial Hospital from January 1, 1998 to December 31, 2008. Two hundred and eighty-one patients (88.9%) had benign disease, and 35 (11.1%) had malignant disease. The most common benign disease was pleomorphic adenoma (115 cases, 36.4%), but the most common disease in male patients was Warthin's tumor, a finding which, as far as we aware, has not been previously been reported in the literature. The incidence of Warthin's tumor seems to be increasing. In malignant disease, the most common was acinic cell carcinoma (8 cases, 22.9%). Compared with benign disease, malignant parotid gland disease more often presents as a hard, painful, fixed and large mass (>3 cm), and more often involves the deep lobe of the parotid gland. Partial parotidectomy was adequate for most tumors, including pleomorphic adenoma. The most common postoperative complication was temporary facial palsy, followed by permanent facial palsy. However, there was no difference in transient facial palsy rate between benign and malignant parotid gland disease, although parotid gland cancer had a higher incidence of permanent facial palsy postoperatively.

Key Words: facial palsy, parotid gland tumor, partial parotidectomy, pleomorphic adenoma, Warthin's tumor

(*Kaohsiung J Med Sci* 2010;26:483–92)

Various parotid gland diseases are seen clinically, including inflammation, sialolithiasis, and benign and malignant tumors. It is important to differentiate among these to make a correct diagnosis and manage them properly. Parotid gland disease often presents as a subauricular mass, with or without pain. Fine-needle aspiration cytology is used for preoperative diagnosis of parotid gland disease in many institutes. However, tumor seeding is the risk of this procedure, although the occurrence rate is low [1]. Few studies have investigated the relationship between the characteristics and type of parotid gland disease. In this study, we retrospectively reviewed patients with parotid gland disease that was managed by surgery in our institute from 1998 to 2008. We discuss the relationship between

Received: Feb 11, 2010 Accepted: Apr 12, 2010

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tumor characteristics and pathology, and consider whether the former can be used to differentiate malignant from benign parotid gland tumors. The results of surgery and its complications are also discussed.

Materials and Methods

We retrospectively reviewed the medical records of patients with parotid gland disease who received surgical treatment at the Department of Otolaryngology of Kaohsiung Medical University Hospital from January 1, 1998 to December 31, 2008. A total of 377 patients with parotid gland disease who were scheduled for surgery were identified through the computerized database in our department. However, the charts of 48 patients were not available. Of the remaining 329 patients, 13 did not undergo surgery for personal reasons or poor physical status. The remaining 316 patients formed the study group and their medical records were reviewed.

All of the surgery was performed by one of our three senior head and neck surgeons. Neck computed tomography (CT) was routinely performed before surgery. All operations were carried out under general anesthesia. The type of operation was dependent upon the character of the tumor, and included partial superficial, deep or total parotidectomy. The greater auricular nerve was sacrificed if necessary. Neck dissection was performed if enlarged neck lymph nodes were found by CT or physical examination. If malignant parotid gland disease was highly suspected during surgery, a specimen was sent for frozen section examination to determine if a more extensive operation was necessary. We routinely identified the facial nerve during operation, and carefully dissected the parotid gland tumor along the course of the facial nerve branch. The facial nerve was preserved as far as possible, unless severe adhesion of the nerve to the suspected malignant tumor was found, because of concern about tumor recurrence. Intraoperative facial nerve monitoring was not routinely used but was performed on selected patients. Specimens were routinely sent for pathological examination.

Radiotherapy or chemotherapy was selectively arranged for patients with malignant disease, depending upon the pathology type and stage of the disease.

The following parameters were collected and analyzed: patient age at diagnosis, sex, tumor size, symptom duration, tumor texture, tumor position, type of operation performed, pathology, postoperative complications, and follow-up time.

We used SPSS version 12.0 (SPSS Inc., Chicago, IL, USA) for statistical analysis. Student's t test was used for between-group comparisons of continuous variables; the paired t test was used to compare paired samples; and the χ^2 test for analysis of categorical data. A p value < 0.05 was considered statistically significant.

Results

The medical records of 329 patients were available and reviewed. Thirteen patients did not undergo surgery for personal reasons or poor physical status, and were excluded from this study. A total number of 316 cases were included in the study and their data were collected and analyzed.

Patient characteristics are shown in Table 1. The average age at diagnosis was 49.4 ± 16.0 years (range, 3–82 years). There were 190 men (60.1%) and 126 women (39.9%). The maximal tumor diameter was 3.11 ± 1.34 cm (range, 1–10 cm). Two hundred and eighty-one patients (88.9%) had benign disease, and 35 (11.1%) had malignant disease.

Among the 281 patients with benign parotid gland disease (Table 2), the most common was pleomorphic adenoma (115 cases, 40.9%), followed by Warthin's tumor (70 cases, 24.9%), and then chronic sialoadenitis (30 cases, 10.7%). Benign disease was more common in male patients ($n = 169$; 60.1%) than female patients ($n = 112$; 39.9%) (Table 1).

There were 115 patients with pleomorphic adenoma in this series (Table 3). It was more common in female ($n = 67$; 58.3%) than male ($n = 48$; 41.7%) patients. For the surgical method, most patients (104 patients, 90.4%) received partial superficial parotidectomy (Table 4), and no patient suffered from tumor recurrence after surgery.

Seventy patients with Warthin's tumor were treated in our institute (Table 3). The average age at diagnosis was 60.6 ± 10.6 years (range, 35–81 years). It was more common in male ($n = 61$; 87.1%) than female ($n = 9$; 12.9%) patients. Two patients (2.9%) suffered from tumor recurrence after surgery, and underwent reoperation.

There were 35 cases of malignant parotid gland lesions, and their characteristics and pathological results

Table 1. Characteristics of all parotid gland diseases patients and comparison of benign and malignant parotid gland disease*

	All	Benign	Malignant	*p*
Number of cases	316 (100)	281 (88.9)	35 (11.1)	
Sex				0.987
Male	190 (60.1)	169 (60.1)	21 (60.0)	
Female	126 (39.9)	112 (39.9)	14 (40.0)	
Age at diagnosis (yr)	49.4 ± 16.0 (3–82)	49.1 ± 16.2 (3–82)	51.5 ± 15.0 (19–81)	0.426
Tumor size (cm)				0.052
<3	217	198	19	
≥3	98	83	16	
Maximal diameter (cm)	3.11 ± 1.34 (1–10)	3.08 ± 1.33 (1–10)	3.37 ± 1.41 (1.5–6.5)	0.224
Tumor location				
Right side	150 (47.5)	132 (47.0)	18 (51.4)	
Left side	163 (51.6)	146 (52.0)	17(48.6)	
Bilateral	3 (0.9)	3 (1.1)	0 (0)	
Symptom duration (mo)	23.55 ± 39.10 (0–360)	24.2 ± 38.49 (0–360)	18.26 ± 43.90 (0–240)	0.425
Tumor pain	49 (15.5)	32 (11.4)	17 (48.6)	0.000†
Tumor fixation	59 (18.7)	40 (14.2)	19 (54.3)	0.000†
Tumor texture				0.008†‡
Soft	26 (8.2)	25 (8.9)	1 (2.9)	
Elastic/firm	197 (62.4)	180 (64.1)	17 (48.6)	
Hard	93 (29.4)	76 (27.0)	17 (48.6)	
Admission duration (d)	5.66 ± 2.16 (2–24)	5.47 ± 1.94 (2–24)	7.23 ± 3.06 (2–16)	0.002†
Tumor location				0.003†§
Superficial lobe	292 (92.4)	264 (94.0)	28 (80.0)	
Deep lobe	20 (6.3)	15 (5.3)	5 (14.3)	
Superficial + deep lobe	4 (1.3)	2 (0.7)	2 (5.7)	
Average follow-up period (mo)	12.53 ± 22.19 (0–127)	10.64 ± 20.92 (0–127)	27.69 ± 26.29 (0–117)	0.001†
Recurrence	8 (2.5)	2 (0.7)	6 (17.1)	0.000†
Radiotherapy	9 (2.8)	0 (0)	9 (25.7)	

*Data presented as *n* (%) or mean ± standard deviation (range); †$p < 0.05$; ‡hard versus non-hard tumor (including elastic/firm and soft tumors); §superficial versus deep lobe (including tumors confined to (benign vs. malignant) deep parotid lobe only and those involving both superficial and deep parotid lobes).

are shown in Tables 1 and 5, respectively. There were 21 male (60.0%) and 14 female (40.0%) patients. Preoperative tumor pain was noted in 17 patients (48.6%). Nineteen patients (54.3%) had preoperative tumor fixation. For preoperative tumor texture, 17 tumors (48.6%) were hard, 17 (48.6%) were elastic (or firm), and only one (2.9%) were soft. The most common malignant parotid gland disease was acinic cell carcinoma (8 cases, 22.9%) (Table 5), followed by mucoepidermoid carcinoma (6 cases, 17.1%). Eight patients (22.9%) received postoperative radiotherapy. Among the six patients with tumor recurrence (17.1%), three had acinic cell carcinoma, one had adenosquamous carcinoma, another had undifferentiated carcinoma, and the final one had lymphoma. The patients with tumor recurrence were managed by reoperation, adjuvant radiotherapy or chemotherapy.

The surgical complications are listed in Table 6. The most common was temporary facial palsy, which occurred in 60 patients (20.0%). Eight patients suffered from permanent facial palsy after surgery, and two of these cases were due to intentional sacrifice of the facial nerve because of severe adhesion of the nerve to the surrounding malignant tissue. The other complications included hematoma, sialocele and wound infection.

Table 2. Histological type of benign parotid gland disease

Pathology	*n* (%)
Benign epithelial tumor	
Pleomorphic adenoma	115 (40.9)
Warthin's tumor	70 (24.9)
Basal cell adenoma	7 (2.5)
Oncocytoma	4 (1.4)
Monomorphic adenoma	2 (0.7)
Myoepithelioma	1 (0.4)
Non-epithelial tumor	
Lipoma	11 (3.9)
Fibrolipoma	2 (0.7)
Cavernous hemangioma	1 (0.4)
Desmoid tumor	1 (0.4)
Schwannoma	1 (0.4)
Parapharyngeal chondroma	1 (0.4)
Angioleiomyoma	1 (0.4)
Cystadenoma	1 (0.4)
Neurilemmoma	1 (0.4)
Cyst	
Epidermoid cyst	3 (1.1)
Salivary duct cyst	1 (0.4)
Hemorrhagic cyst	1 (0.4)
Inflammation and infection	
Chronic sialoadenitis (inflammation)	30 (10.7)
Lymph node reactive hyperplasia	8 (2.8)
Caseating granuloma	3 (1.1)
Actinomycosis	2 (0.7)
Kimura's disease	2 (0.7)
Necrotizing sialometaplasia	1(0.4)
Others	
Lymphoepithelial lesion	7 (2.5)
Sialolithiasis (stone)	2 (0.7)
Mucocele	1 (0.4)
Ductal ectasia	1 (0.4)
Granulomatous ductal stenosis	1 (0.4)
Total	281 (100)

Discussion

Salivary gland tumors account for 3–6% of all head and neck tumors, and 70–85% of salivary gland neoplasms originate in the parotid gland [2,4]. Generally, the most common benign parotid gland neoplasm is pleomorphic adenoma, and the most common malignant one is mucoepidermoid carcinoma. Apart from tumors, various kinds of parotid gland diseases are seen clinically. Most inflammatory parotid gland diseases can be treated by conservative management and few need surgical intervention, although surgery is always necessary for parotid gland tumors.

In our study, parotid gland disease was more common in male patients (male:female = 3:2), and this is similar to the result in a previous study [5]. Parotid gland disease was most prevalent in the middle-aged group (average age at diagnosis = 49.4 years).

In benign disease, the most common form was pleomorphic adenoma (115 cases, 36.9%), followed by Warthin's tumor (70 cases, 22.15%). However, the most common benign parotid gland disease in male patients was Warthin's tumor (61 cases, 32.1%), and not pleomorphic adenoma (48 cases, 25.3%). As far as we are aware, this has not been reported previously.

In our study, pleomorphic adenoma was the most common benign parotid gland disease, and it accounted for 40.9% of all cases, which is similar to other studies [6,7]. Pleomorphic adenoma was more common in women (male:female = 1:1.5), and this matches the result by Eveson et al (male:female = 1:1.4) [6]. Most of our patients were between 35 and 55 years old. Pleomorphic adenoma can have small projections that invade surrounding normal parotid tissue, and the recurrence rate is high if only enucleation of the tumor is performed, because the tumor can arise from these small projections. Later complete superficial parotidectomy is suggested in superficial parotid gland tumor, but the complication rate is increased because of more extensive surgery. Recently, partial parotidectomy (also called limited parotidectomy), which means removal of tumor mass together with 1–2 cm of surrounding normal parotid tissue, has been advocated [8,9]. Partial parotidectomy for benign parotid gland lesions can remove the lesion without increasing the recurrence rate and produce fewer complications compared with those managed by complete superficial parotidectomy [8]. In our institute, we manage patients with pleomorphic adenoma by partial parotidectomy in most cases (Table 4). No recurrence of pleomorphic adenoma is found during follow-up. However, the weak point is that our average follow-up time is not long (12.87 ± 25.47 months; range, 0–127 months), and there is a possibility that recurrence might occur later. Nevertheless, during the past 10 years, no patient has visited us again due to tumor recurrence.

The second most common benign parotid gland tumor in our series was Warthin's tumor, and it accounted for 24.9% and 22.2% of benign parotid gland disease and all parotid gland disease, respectively (Tables 2 and 3). Eveson et al [6] have shown that

Table 3. Comparison between pleomorphic adenoma and Warthin's tumor*

	Pleomorphic adenoma	Warthin's tumor	*p*
Number of cases	115 (36.4)‡	70 (22.2)‡	0.000†
Sex			
Male	48 (41.7)	61 (87.1)	0.000†
Female	67 (58.3)	9 (12.9)	
Age at diagnosis (yr)	43.5 ± 13.9 (16–76)	60.6 ± 10.6 (35–81)	0.000†
Age (yr)			0.000†
< 45	64	2	
≥ 45	51	68	
Average tumor size (cm)			0.053
< 3	89	45	
≥ 3	26	25	
Maximal diameter (cm)	2.87 ± 1.16 (1.0–7.5)	3.28 ± 1.26 (1.5–8.0)	0.025†
Tumor location			0.101
Right side	60 (52.2)	25 (35.7)	
Left side	54 (47.0)	39 (55.7)	
Bilateral	1 (0.9)	6 (8.6)	
Symptom duration (mo)	33.38 ± 46.87 (0–360)	19.79 ± 32.81 (0–216)	0.032†
Tumor pain	1 (0.9)	7 (10)	0.003†
Tumor fixation	14 (12.2)	8 (11.4)	0.897
Tumor texture			0.363§
Soft	3 (2.6)	7 (10.0)	
Elastic/firm	73 (63.5)	54 (77.1)	
Hard	39 (33.9)	9 (12.9)	
Admission duration (d)	5.23 ± 1.20 (2–9)	5.47 ± 1.30 (4–12)	0.195
Tumor location			0.166‖
Superficial lobe	106 (92.2)	68 (97.1)	
Deep lobe	8 (7.0)	2 (2.9)	
Superficial + deep lobe	1 (0.9)	0 (0)	
Average follow-up period (mo)	12.87 ± 25.47 (0–127)	9.07 ± 18.42 (0–94)	0.279
Recurrence	0 (0)	2 (2.9)	

*Data presented as *n* (%) or mean ± standard deviation (range); †$p < 0.05$; ‡% from comparison with the total number of parotid disease; §hard versus non-hard tumor (including elastic/firm and soft tumors); ‖superficial versus deep lobe (including tumors confined to deep parotid lobe only and those involving both superficial and deep parotid lobes).

Warthin's tumor accounted for 6.9% of all parotid gland tumors. A study by Upton et al [9] has reported that 12.7% of benign parotid lesions were Warthin's tumor. Our occurrence rate for Warthin's tumor was higher than that in the above two studies. However, a series based on an Asian population has shown that Warthin's tumor constituted 25% of all parotid gland tumors [10], and this is consistent with our study. Another study based on a Chinese population has shown that Warthin's tumor was the most common benign parotid gland lesion (37%), which was even more common than pleomorphic adenoma [11]. It seems that Warthin's tumor is more prevalent in ethnic Chinese populations, but the exact reason is unknown. Genetic factors should be considered. Epstein–Barr virus (EBV) infection is prevalent in Southeast Asia. Some earlier studies have described that EBV is found in Warthin's tumor and is thought to be related to tumor occurrence [12,13]. However, more recent studies have proved that EBV infection is not involved in the etiology of Warthin's tumor [14,15]. Another well-documented etiological factor in Warthin's tumor is cigarette smoking [16,17]. Asians in general have 40 times increased risk of developing Warthin's tumor if they smoke [10].

In our study, Warthin's tumor was prevalent in older patients (average age = 60.6 ± 10.6 years), and most (68 cases; 97%) were > 45 years. As a result, if a

Table 4. The operation method in different groups of parotid gland disease

	Total	Benign	Malignant	Pleomorphic adenoma	Warthin's tumor
Partial superficial parotidectomy	274	257	17	104	68
Complete superficial parotidectomy	7	2	5	2	0
Partial deep parotidectomy	8	8	0	2	2
Total parotidectomy	19	9	10	7	0
Neck dissection	6	0	6	0	0
Excision, enucleation	4	3	1	0	0
Incision and drainage	5	5	0	0	0
Biopsy	3	1	2	0	0

Table 5. Histological type of malignant parotid gland disease

Pathology	*n* (%)
Acinic cell carcinoma	8 (22.9)
Mucoepidermoid carcinoma	6 (17.1)
Adenoid cystic carcinoma	3 (8.6)
Malignant lymphoepithelial lesion	3 (8.6)
Salivary duct carcinoma	3 (8.6)
Lymphoma	3 (8.6)
Carcinoma ex pleomorphic adenoma	2 (5.7)
Adenocarcinoma	2 (5.7)
Metastatic tumor	2 (5.7)
Myoepithelial carcinoma	1 (2.9)
Undifferentiated carcinoma	1 (2.9)
Adenosquamous carcinoma	1 (2.9)
Total	35 (100)

Table 6. Postoperative complications in benign and malignant gland diseases*

Complication	Benign	Malignant	Total	$p^{\dagger}$
Temporary facial palsy	54 (19.2)	6 (17.1)	60 (20.0)	0.786
Permanent facial palsy	3 (1.1)	5 (14.3)	8 (2.5)	0.000‡
Hematoma	5 (1.8)	0 (0)	5 (1.6)	
Frey's syndrome	4 (1.4)	1 (2.9)	5 (1.6)	
Sialocele	1 (0.4)	0 (0)	1 (0.3)	
Infection	4 (1.4)	0 (0)	4 (1.3)	

*Data presented as *n* (%); †benign versus malignant gland diseases; ‡$p < 0.05$.

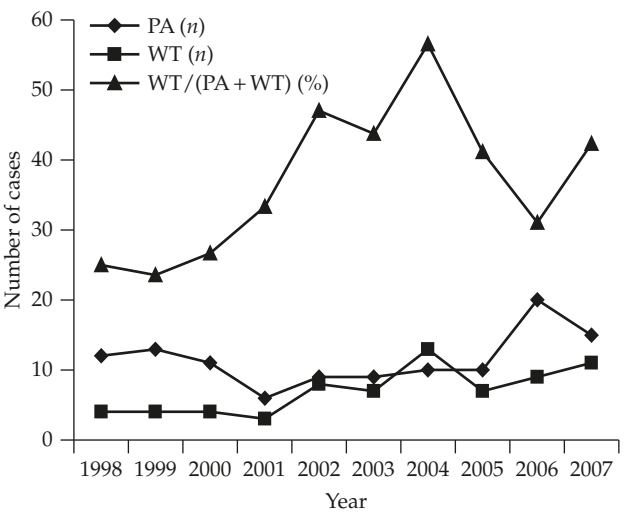

Figure. *Number of cases of Warthin's and pleomorphic adenoma. Increasing incidence and number of cases of Warthin's tumor was found during the last decade. PA = pleomorphic adenoma; WT = Warthin's tumor.*

patient with parotid gland tumor is younger than 45 years old, we can reasonably assume that his tumor is not Warthin's tumor. The male to female ratio was 6.8:1, and the ratio was higher than that in other studies [10,17]. Another interesting finding was that the most common benign tumor in male patients in our study was Warthin's tumor (32.1%) and not pleomorphic adenoma (25.3%). Six patients (8.6%) had bilateral Warthin's tumor, and the incidence was consistent with that in other studies [10,17]. In addition, a tendency towards an increased occurrence rate of Warthin's tumor was found in our study (Figure), although this contradicts Chung et al [10] who observed no increasing incidence of Warthin's tumor. The exact reason for increasing incidence of Warthin's tumor is unknown, but it could be related to the present longer lifespan and that more surgery is performed on older people.

There were some different characteristics for the two most common benign parotid gland tumors (Table 3). First, the Warthin's tumor was prevalent in the older patient group, and most of them were male (87.1%). In contrast, pleomorphic adenoma was more prevalent in the middle-aged group (average age = 43.5 years), and was more common in female patients

(male:female=2:3). Compared with pleomorphic adenoma, the size of Warthin's tumor was larger, but the symptom duration was significantly shorter than that of pleomorphic adenoma (Table 3). This implies that the growth rate of Warthin's tumor was faster than that of pleomorphic adenoma. More tumor pain was also noted in Warthin's tumor (10%) than pleomorphic adenoma (0.9%).

Another group of parotid gland diseases is inflammatory diseases, and most of these inflammatory diseases can be managed initially with medical treatment including analgesics, antibiotics and mouthwashes. If patients do not respond to medical treatments, or a tumor cannot be excluded, or sialography shows appreciably altered duct anatomy or sialolithiasis, then surgical intervention becomes necessary [18]. Thirty patients with chronic sialoadenitis have received parotidectomy in the past 10 years in our institute. Some of them have received surgery because of persistent symptoms such as chronic pain or parotid gland swelling, and others have been operated upon under suspicion of malignancy. Nevertheless, sometimes it might be difficult to distinguish chronic parotitis from parotid gland cancer because both conditions often present as a painful mass. However, tumor fixation was found in only six patients (20.0%) with chronic parotitis but in 17 patients (48.6%) with parotid gland cancer. Also, about half of the parotid gland cancer (48.6%) presented as a hard mass, and only 20% (6 cases) of chronic parotitis is hard. Thus tumor texture and mobilization could be used as clues to distinguish chronic parotitis from parotid gland cancer preoperatively.

Thirty-five patients with malignant parotid gland diseases were operated upon in our study (Table 2), and the malignancy rate was 11.1%, which is compatible with the wide range of malignancy rates reported in other studies [2,19]. Among these patients, the most common malignancy was acinic cell carcinoma (8 cases, 22.9%), followed by mucoepidermoid carcinoma (6 cases, 17.1%). However, the most common malignant parotid gland disease described in the literature is mucoepidermoid carcinoma [20,21], and not acinic cell carcinoma. This difference could be associated with our small number of patients. Most of our malignant parotid gland disease was managed by partial or total parotidectomy. We did not routinely perform neck dissection unless there was an enlarged lymph node noted preoperatively by physical examination or CT. The management for N0 neck remains controversial. Regis De Brito Santos et al [22] have suggested that patients with high-risk histological types and advanced tumor stage could benefit from elective neck treatment. Most authors have advocated performing neck dissection on the basis of the histology of the primary parotid carcinoma and the tumor grade, because these characteristics most influence the risk of occult metastases in primary salivary carcinoma [23,24]. We preserve the integrity of the facial nerve unless there is tumor adhesion to the facial nerve.

A recent study has shown that radical procedures did not increase 5-year survival rates, and the integrity of the facial nerve should be preserved unless the nerve is imbedded in, or adherent to, the parotid carcinoma [25]. Six of our patients with parotid gland cancer suffered from tumor recurrence, and the recurrence rate was 17.1%, which is similar to that in other studies [20,26]. Patients with cancer recurrence were managed with adjuvant radiotherapy or salvage operation, depending on the disease severity and patient's tolerance.

There were some different characteristics between benign and malignant parotid gland diseases in our study (Table 1). The incidence of tumor fixation and tumor pain was significantly higher in malignant disease. Besides, about half of the malignant tumors were palpated as hard masses, but only 27% of benign parotid gland diseases were hard ($p<0.05$). In contrast, malignant tumors more frequently involved the deep lobe of the parotid gland ($p<0.05$). Thus if we encounter patients with a parotid gland tumor that presents as a hard, tender, fixed or large mass, we should suspect malignancy.

The most common postoperative complication was temporary facial palsy (20.0%), followed by permanent facial palsy (2.5%). The occurrence rate of temporary facial palsy did not differ between benign and malignant tumors, but the occurrence rate of permanent facial palsy was significantly higher in malignant tumors (14.3%) (Table 6). Zbaren et al [20] reported that the facial function impairment rate after surgery for malignant parotid gland disease was 16%. Guntinas-Lichius et al [27] reported a series of 610 patients with benign parotid gland lesions that were managed by surgery, and the facial palsy rate was about 18%. O'Brien et al [7] reported a series of 363 patients with 24% and 3% rates of temporary

and permanent facial palsy, respectively. Our result is similar to the above studies. Facial expression is important for social activity, and preservation of the facial nerve function is important. We used intraoperative electromyography for facial nerve monitoring in selective cases. Although Meier et al [28] reported that the electromyography facial nerve monitoring is not reliable in predicting postoperative facial nerve injuries, others consider that this system is beneficial [29,30]. Some factors increase the risk of facial nerve palsy. Huang et al [25] reported that the risk factors for postoperative facial palsy include increasing tumor size, deep lobe tumor location, and tumor invasion of the facial nerve.

In conclusion, the various parotid gland diseases should be carefully differentiated. In our study, the most common benign parotid gland disease was pleomorphic adenoma. However, the most common benign tumor in male patients was Warthin's tumor, a finding which, as far as we aware, has not previously been reported. In addition, the prevalence rate of Warthin's tumor seems to be higher in ethnic Chinese populations, although the exact reason is unknown. Compared with benign parotid gland disease, malignant disease more often presented as a hard, painful, fixed and large mass, and involved the deep parotid gland. Partial parotidectomy is a reliable surgical method for most parotid gland diseases, including pleomorphic adenoma. For postoperative complications, the occurrence rate of transient facial palsy did not differ among benign and malignant parotid lesions, but the permanent facial palsy rate was significantly higher for parotid gland cancer.

References

1. Supriya M, Denholm S, Palmer T. Seeding of tumor cells after fine needle aspiration cytology in benign parotid tumor: a case report and literature review. *Laryngoscope* 2008;118:263–5.
2. Spiro RH. Salivary neoplasms: overview of a 35-year experience with 2,807 patients. *Head Neck Surg* 1986;8: 177–84.
3. Woods JE, Chong GC, Beahrs OH. Experience with 1,360 primary parotid tumors. *Am J Surg* 1975;130: 460–2.
4. Eneroth CM. Incidence and prognosis of salivary-gland tumours at different sites. A study of parotid, submandibular and palatal tumours in 2632 patients. *Acta Otolaryngol Suppl* 1969;263:174–8.
5. Bova R, Saylor A, Coman WB. Parotidectomy: review of treatment and outcomes. *ANZ J Surg* 2004;74:563–8.
6. Eveson JW, Cawson RA. Salivary gland tumours. A review of 2410 cases with particular reference to histological types, site, age and sex distribution. *J Pathol* 1985;146:51–8.
7. O'Brien CJ. Current management of benign parotid tumors—the role of limited superficial parotidectomy. *Head Neck* 2003;25:946–52.
8. Johnson JT, Ferlito A, Fagan JJ, et al. Role of limited parotidectomy in management of pleomorphic adenoma. *J Laryngol Otol* 2007;121:1126–8.
9. Upton DC, McNamar JP, Connor NP, et al. Parotidectomy: ten-year review of 237 cases at a single institution. *Otolaryngol Head Neck Surg* 2007;136:788–92.
10. Chung YF, Khoo ML, Heng MK, et al. Epidemiology of Warthin's tumour of the parotid gland in an Asian population. *Br J Surg* 1999;86:661–4.
11. Lim LH, Chao SS, Goh CH, et al. Parotid gland surgery: 4-year review of 118 cases in an Asian population. *Head Neck* 2003;25:543–8.
12. Taira S, Okuda M, Osato T, et al. Detection of Epstein–Barr virus DNA in salivary gland tumors. *Nippon Jibiinkoka Gakkai Kaiho* 1992;95:860–8. [In Japanese]
13. Santucci M, Gallo O, Calzolari A, et al. Detection of Epstein–Barr viral genome in tumor cells of Warthin's tumor of parotid gland. *Am J Clin Pathol* 1993;100: 662–5.
14. Laane CJ, Murr AH, Mhatre AN, et al. Role of Epstein–Barr virus and cytomegalovirus in the etiology of benign parotid tumors. *Head Neck* 2002;24:443–50.
15. van Heerden WF, Kraft K, Hemmer J, et al. Warthin's tumour is not an Epstein–Barr virus related disease. *Anticancer Res* 1999;19:2881–3.
16. Pinkston JA, Cole P. Cigarette smoking and Warthin's tumor. *Am J Epidemiol* 1996;144:183–7.
17. Teymoortash A, Krasnewicz Y, Werner JA. Clinical features of cystadenolymphoma (Warthin's tumor) of the parotid gland: a retrospective comparative study of 96 cases. *Oral Oncol* 2006;42:569–73.
18. Moody AB, Avery CM, Walsh S, et al. Surgical management of chronic parotid disease. *Br J Oral Maxillofac Surg* 2000;38:620–2.
19. Harney M, Walsh P, Conlon B, et al. Parotid gland surgery: a retrospective review of 108 cases. *J Laryngol Otol* 2002;116:285–7.
20. Zbaren P, Schupbach J, Nuyens M, et al. Carcinoma of the parotid gland. *Am J Surg* 2003;186:57–62.
21. Witten J, Hybert F, Hansen HS. Treatment of malignant tumors in the parotid glands. *Cancer* 1990;65:2515–20.
22. Regis De Brito Santos I, Kowalski LP, Cavalcante De Araujo V, et al. Multivariate analysis of risk factors for neck metastases in surgically treated parotid carcinomas. *Arch Otolaryngol Head Neck Surg* 2001;127:56–60.
23. Zbaren P, Schupbach J, Nuyens M, et al. Elective neck dissection versus observation in primary parotid carcinoma. *Otolaryngol Head Neck Surg* 2005;132:387–91.

24. Kelley DJ, Spiro RH. Management of the neck in parotid carcinoma. *Am J Surg* 1996;172:695–7.
25. Huang CC, Tseng FY, Chen ZC, et al. Malignant parotid tumor and facial palsy. *Otolaryngol Head Neck Surg* 2007;136:778–82.
26. Pedersen D, Overgaard J, Sogaard H, et al. Malignant parotid tumors in 110 consecutive patients: treatment results and prognosis. *Laryngoscope* 1992;102:1064–9.
27. Guntinas-Lichius O, Gabriel B, Klussmann JP. Risk of facial palsy and severe Frey's syndrome after conservative parotidectomy for benign disease: analysis of 610 operations. *Acta Otolaryngol* 2006;126:1104–9.
28. Meier JD, Wenig BL, Manders EC, et al. Continuous intraoperative facial nerve monitoring in predicting postoperative injury during parotidectomy. *Laryngoscope* 2006;116:1569–72.
29. Dulguerov P, Marchal F, Lehmann W. Postparotidectomy facial nerve paralysis: possible etiologic factors and results with routine facial nerve monitoring. *Laryngoscope* 1999;109:754–62.
30. Terrell JE, Kileny PR, Yian C, et al. Clinical outcome of continuous facial nerve monitoring during primary parotidectomy. *Arch Otolaryngol Head Neck Surg* 1997; 123:1081–7.

南台灣腮腺疾病的特徵與手術結果分析

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腮腺存在著各式各樣的疾病，包括發炎、結石及良性或惡性腫瘤等。能鑑別並正確地診斷對治療是很重要的。本篇研究希望藉由對腮腺疾病臨床特徵的分析，探討是否可藉此於術前區分出惡性腮腺腫瘤。我們以回溯性方式收集自 1998 年 1 月 1 日至 2008 年 12 月 31 日於高雄醫學大學附設醫院接受腮腺手術的病人，一共收集 316 個有效個案，對其資料作統計分析。在這 316 個接受腮腺手術的病人中，281 位（88.9%）是良性疾病，35 位（11.1%）是惡性疾病。最常見的良性疾病是 pleomorphic adenoma（115 位；36.4%），但是在男性病人中，最常見良性腫瘤的卻是 Warthin's tumor，這在以前的文獻中未曾報告過。另一方面，Warthin 氏腫瘤的盛行率似乎有上升的趨勢。惡性疾病中，最常見的是 acinic cell carcinoma（8 位；22.9%）。和良性腫瘤比較起來，惡性腫瘤比較常表現出硬的、疼痛、固著及較大（> 3 cm）的腫塊，且較常侵犯腮腺的深葉（deep lobe）。在手術方式上，局部腮腺切除術（partial parrotidectomy）對大部分的腮腺疾病是有效的，包括 pleomorphic adenoma。最常見的術後併發症是暫時性顏面神經麻痺，其次是永久性顏面神經麻痺。然而，暫時性顏面神經麻痺的發生率在良性和惡性腫瘤之間沒有差異，但惡性腫瘤術後出現永久性顏面神經麻痺的機會較高。

關鍵詞：顏面神經麻痺，腮腺腫瘤，局部腮腺切除手術，pleomorphic adenoma，Warthin 氏腫瘤

（高雄醫誌 2010;26:483–92）

收文日期：98 年 2 月 11 日
接受刊載：98 年 4 月 12 日
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