Surgical Treatment Outcomes of Patients with Bilateral Warthin Tumors in the Parotid Gland

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Received: 11 January 2012 / Accepted: 19 January 2012 / Published online: 1 February 2012
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Abstract We describe the treatment outcomes of patients with bilateral Warthin tumors in the parotid gland according to surgical methods. The medical records of ten patients with bilateral Warthin tumors in the parotid gland who underwent surgery between 2004 and 2011 were retrospectively reviewed. Ten patients were included in the study and 13 parotidectomies were performed. Patients with bilateral Warthin tumors in the parotid gland were divided into three groups according to the surgical methods used to treat these individuals. In group 1, the patients were closely observed without undergoing contralateral parotidectomy after unilateral parotidectomy. In group 2, the patients underwent concurrent bilateral parotidectomies. In group 3, the patient underwent contralateral parotidectomy 2 months after unilateral parotidectomy was performed. The overall rate of transient facial nerve dysfunction was 31%. Our findings suggest that concurrent superficial parotidectomy may be an appropriate method for treating bilateral Warthin tumors in the parotid gland, at least for desired patients. The symptoms of this type of tumor and physical examination findings are frequently non-specific and present in the unilateral parotid gland. Therefore, a high degree of discernment is needed and imaging techniques are essential for the determining the correct pre-operative diagnosis.

Keywords Treatment outcome · Bilateral · Warthin tumor · Parotid gland

Introduction

Warthin tumors (WTs) are the second most common type of benign salivary gland tumors and are usually located in the parotid gland [1, 2]. WTs are typically appear as a slowly growing, soft tissue mass located in the inferior lobe of the parotid gland. WTs occur most commonly in Caucasian and Asian patients, and are usually diagnosed in individuals 60 years or older [3]. These tumors appear more frequently in males, but increasing incidence among females has been reported [4]. WTs are highly associated with bilateral tumors. WTs are bilateral in 4–10% of all cases [5, 6]. To date, no reports have been published on the surgical treatment outcomes of bilateral WTs. In this study, we report the surgical treatment outcomes of patients with bilateral WTs in the parotid gland according to surgical treatment methods.

Materials and methods

After obtaining Institutional Review Board (IRB) approval of Chonnam National University Hospital, we identified 246 patients with parotid tumors for our study who were treated at Chonnam National University Hospital and Hwasun Hospital between January 2004 and May 2011. Among the 246 patients, ten had bilateral WTs in the parotid gland. The medical records of these individuals were reviewed retrospectively. The data collected included presenting symptoms, fine needle aspiration cytology (FNAC), operation time, complications, hospitalization period, and follow-up period.

The patients with bilateral WTs in the parotid gland were divided into three groups depending on their surgical treatment methods. Patients in group 1 were closely

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observed without undergoing contralateral parotidectomy after unilateral parotidectomy. Patients in group 2 underwent concurrent bilateral parotidectomies. Finally, the patient in group 3 underwent contralateral parotidectomy 2 months after unilateral parotidectomy.

When the WT was localized in the superficial lobe of the parotid gland, a superficial parotidectomy was performed. Total parotidectomy is indicated for tumors in the deep lobe. The WTs were removed and sent for pathologic examination. Drainage was performed and maintained by aspiration. Facial dysfunction was clinically evaluated according to the following categories: isolated dysfunction of the marginal mandibular branch, partial paralysis of the facial nerve, and complete paralysis of the facial nerve.

Results

This study included ten patients (seven males and three females), a total of 13 parotidectomies were performed for this group of individuals. The age of the patients ranged from 49 to 81 years with a mean of 65.6 years. The incidence of bilateral WTs among patients with WT was 4.1% (ten out of 246 patients).

Ten patients presented with a chief complaint of parotid swelling and the presence of a mass. However, only six patients presented bilateral parotid swelling and masses while, the other four patients only presented unilateral parotid swelling and mass. Four patients with unilateral parotid swelling were diagnosed by pre-operative CT of the

neck. Other characteristic symptoms of parotid tumors, such as pain and facial nerve paralysis were not observed.

All patients underwent pre-operative FNAC. WTs were noted in eight out of ten patients. The other two patients were respectively noted pleomorphic adenoma and chronic sialoadenitis.

All patients underwent surgical treatment under general anesthesia. In group 1, seven patients (70%) out of ten patients were closely observed without undergoing contralateral parotidectomy after unilateral parotidectomy. The operation time ranged from 2.5–3.5 h (mean, 3 h). The hospitalization period ranged from 5–10 days (mean, 7.7 days). Isolated dysfunction of the marginal mandibular nerve after operation was observed in three patients (43%). No partial or complete facial dysfunction was noted. There were no tumor recurrences during the follow-up period, which ranged from 1–23 months (mean, 7.3 months). A summary of the group 1 clinical data is shown in Table 1.

In group 2, two patients (20%) out of ten patients underwent concurrent bilateral parotidectomies. The operation time ranged from 4–4.5 h (mean, 4.25 h). The hospitalization period ranged from 5–6 days (mean, 5.5 days). Isolated dysfunction of the marginal mandibular nerve after operation was noted in one facial side among four facial sides (25%). No partial or complete facial dysfunction was noted. There were no tumor recurrences during the follow-up period, which ranged from 1–10 months (mean, 5.5 months). A summary of the group 1 clinical data is shown in Table 2.

The one patient in group 3 underwent contralateral parotidectomy 2 months after unilateral parotidectomy. For

Table 1 Summary of the clinical data for group 1

Case number	Age/gender	Parotid swelling	Tumor location	FNAC	Operation time (hours)	Hospitalization period (days)	Facial nerve dysfunction	Follow-up period (months)
1	57/M	Unilateral	S	PA	2.5	10	None	NED (1)
2	67/M	Bilateral	S	WT	2.5	8	None	NED (5)
3	73/M	Unilateral	D	WT	3	8	LW	NED (1)
4	54/M	Bilateral	D	WT	3	10	None	NED (18)
5	57/M	Bilateral	S	WT	3.5	5	LW	NED (2)
6	80/F	Unilateral	S	CS	3.5	6	LW	NED (1)
7	79/F	Unilateral	S	WT	3	7	None	NED (23)

FNAC fine needle aspiration cytology, S superficial lobe, D deep lobe, PA pleomorphic adenoma, WT Warthin tumor, CS chronic sialoadenitis, LW lower lip weakness, NED no evidence of disease

Table 2 Summary of the clinical data for group 2

Case number	Age/gender	Parotid swelling	Tumor location	FNAC	Operation time (hours)	Hospitalization period (days)	Facial nerve dysfunction	Follow-up period (months)
8	49/M	Bilateral	S	WT	4	6	R-LW	NED (1)
9	59/M	Bilateral	S	WT	4.5	7	None	NED (10)

R-LW right facial side-lower lip

both parotidectomies, the operation time was 2.5 h and the hospitalization period was 8 days. No facial dysfunction or tumor recurrences during follow-up were noted in this patient. The clinical data for this patient is shown in Table 3.

Discussion

Warthin tumors, also known as papillary cystadenoma lymphomatosum, are tumors composed of a papillary, bilayered, oncocytic epithelium with a dense lymphoid stroma [3]. The true incidence of WTs is difficult to estimate, since there appear to be regional, national and racial differences, as well as an increase in incidence during the last decade [6]. WTs are bilateral in 4–10% of all cases and multifocal in 2% of the cases [5, 6]. In our study, ten of 246 patients (4.1%) had bilateral WTs with parotid gland involvement.

The pathogenesis and origin of WTs are unknown. A possible contributing factor of WT pathogenesis may be progesterone receptors however, data about the etiology of this disease is still lacking [7]. There is a strong association between WTs and smoking, particularly if the tumor is bilateral. The increase of female smokers in the last few decades may account for the increase incidence of this tumor in females [3, 4]. In our study, two females (case number 7 and 10) were nonsmokers. However, eight patients were heavy smokers and had a history of heavy smoking with than 10 pack years (range, 10–45 pack years mean, 25.6 pack years).

Warthin tumors are can appear as asymptomatic masses in the lower portion of the parotid gland slowly been enlarge over many years [3]. Similar to a previous report [3], progressive asymptomatic enlargement of parotid gland was the presenting symptom of patients with WTs in this study. However, four out of ten patients presented with unilateral parotid masses. In addition, these masses were not detected during physical examination. These made diagnosing bilateral WTs difficult. Therefore, we found that the diagnosis of bilateral WTs in the parotid gland mainly depends on the results of imaging techniques, such as CT.

On CT images of WTs, enhancing, well-circumscribed lesions with a thin fibrous capsule and partially cystic lesion are frequently observed [3]. In our study, all patients

underwent pre-operative CT. Ultimately we diagnosed four patients with WTs in the parotid gland who did not have bilateral parotid swelling and not detected during physical examination.

The treatment of choice for WTs is surgery. There is an ongoing controversy about the appropriate surgical procedure for WTs. Some authors recommend simple enucleation or partial superficial parotidectomy [8, 9]. In the present study, eleven out of the 13 parotidectomies underwent superficial parotidectomy. Subtotal parotidectomy was performed on two out of the 13 parotidectomies.

When planning the surgical intervention for treating the bilateral WTs in the parotid gland, we had to choose between unilateral parotidectomy without contralateral parotidectomy, concurrent bilateral parotidectomies, and time-interval bilateral parotidectomies. We selected the appropriate surgical method depending on the patient's desire, pre-operative FNAC and CT findings, and post-operative results of unilateral parotidectomy. The patients, who had unilateral parotid swelling and desired unilateral parotidectomy (40%), underwent unilateral parotidectomy. When the patient was found to have a WT based on the result of unilateral parotidectomy, we informed the patients about the characteristics of WT, such as bilaterality, and rare malignancy transformation [6, 10]. If the patient did not wish to undergo contralateral parotidectomy, we recommended regular follow-up. The patients, who had bilateral parotid swelling and desired unilateral parotidectomy (30%), also underwent unilateral parotidectomy and were treated in the manner described above. However, above two surgical methods have fatal defect, which the patients did not regularly visit at hospital. In our study, the follow-up period ranged from 1–23 months (mean, 7.3 months). However, almost all of the patients were followed-up for under 5 months except for two.

The patients, who had bilateral parotid swelling and desired bilateral parotidectomies (30%), underwent concurrent bilateral parotidectomies or time-interval bilateral parotidectomies. However, time-interval bilateral parotidectomies are needed twice admission period and hospital costs than concurrent bilateral parotidectomies without particular merits.

The incidence of postoperative transient facial nerve dysfunction has been reported to range from 8 to 65% among patients treated for benign parotid tumor [11–13]. In our study, the overall incidence of transient facial nerve

Table 3 Summary of the clinical data for group 3

Case number	Age/gender	Parotid swelling	Tumor location	FNAC	Operation time (hours)	Hospitalization period (days)	Facial nerve dysfunction	Follow-up period (months)
10	81/F	Bilateral	S	WT	2.5	8	None	NED (3)
			S	WT	2.5	8	None	NED (1)

dysfunction was 31% (4/13). In patients who underwent concurrent bilateral parotidectomies, the incidence of transient facial nerve dysfunction was 25% (1/4), which is comparable to that reported in other studies. No permanent facial nerve paralysis was observed in any patient.

Conclusion

Bilateral WTs are a rare presenting form of parotid tumors. The symptoms of bilateral WTs in the parotid gland and appearance on physical examination are frequently non-specific. Therefore, a high degree of caution is needed when encountering suspected cases of these tumors and imaging methodologies, such as CT, are essential for making the correct pre-operative diagnosis. The incidence of postoperative facial nerve dysfunction, length of hospitalization, and operation time for patients who underwent concurrent bilateral parotidectomies was similar or better than for patients who underwent unilateral parotidectomy. Based on the results of our study, we suggest that concurrent superficial parotidectomies may be preferable for treating WTs in the parotid gland instead of unilateral parotidectomy, at least for desired patients.

Key messages

- The incidence of bilateral WTs among patients with WT was 4.1%.
- A high degree of caution is needed when encountering suspected cases of bilateral WTs and imaging methodologies are essential for making the correct pre-operative diagnosis.
- We suggest that concurrent superficial parotidectomies may be preferable for treating bilateral WTs in the parotid gland instead of unilateral parotidectomy, at least for desired patients.

Competing interests No sponsorships or competing interests have been disclosed for this article.

References

1. Eneroth CM (1971) Salivary gland tumors in the parotid gland, submandibular gland, and the palate region. *Cancer* 27(6): 1415–1418
2. Foote FW Jr, Frazell E (1953) Tumors of the major salivary glands. *Cancer* 6(6):1065–1133
3. Kremp AN, Nelson BL (2008) Bilateral warthin tumors of the parotid gland. *Head Neck Pathol* 2(3):175–176
4. Peter Klussmann J, Wittekindt C, Florian Preuss S, Al Attab A, Schroeder U, Guntinas-Lichius O (2006) High risk for bilateral Warthin tumor in heavy smokers—review of 185 cases. *Acta Otolaryngol* 126(11):1213–1217
5. Lefor AT, Ord RA (1993) Multiple synchronous bilateral Warthin's tumors of the parotid glands with pleomorphic adenoma. Case report and review of the literature. *Oral Surg Oral Med Oral Pathol* 76(3):319–324
6. Hilton JM, Phillips JS, Hellquist HB, Premachandra DJ (2008) Multifocal multi-site Warthin tumour. *Eur Arch Otorhinolaryngol* 265(12):1573–1575
7. Teymoortash A, Werner JA (2005) Tissue that has lost its track: Warthin's tumour. *Virchows Arch* 446(6):585–588
8. Yu GY, Ma DQ, Liu XB, Zhang MY, Zhang Q (1998) Local excision of the parotid gland in the treatment of Warthin's tumour. *Br J Oral Maxillofac Surg* 36(3):186–189
9. McGurk M, Thomas BL, Renehan AG (2003) Extracapsular dissection for clinically benign parotid lumps: reduced morbidity without oncological compromise. *Br J Cancer* 89(9):1610–1613
10. Seifert G (1997) Bilateral mucoepidermoid carcinomas arising in bilateral pre-existing Warthin's tumours of the parotid gland. *Oral Oncol* 33(4):284–287
11. Witt RL (1998) Facial nerve monitoring in parotid surgery: the standard of care? *Otolaryngol Head Neck Surg* 119(5):468–470
12. Laccourreye O, Brasnu D, Jouffre V, Cauchois R, Naudou P, Laccourreye H (1995) Dysfunction of the facial nerve following total conservative parotidectomy for pleomorphic adenoma. *Ann Otolaryngol Chir Cervicofac* 112(1–2):63–68
13. Mehle ME, Kraus DH, Wood BG, Benninger MS, Eliachar I, Levine HL, Tucker HM, Lavertu P (1993) Facial nerve morbidity following parotid surgery for benign disease: the Cleveland Clinic Foundation experience. *Laryngoscope* 103(4 Pt 1): 386–388