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Survival in patients with parotid gland carcinoma – Results of a multi-center study☆

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ABSTRACT

Background: Parotid gland carcinoma is a rare malignancy, comprising only 1–4% of head and neck carcinomas; therefore, it is difficult for a single institution to perform meaningful analysis on its clinical characteristics. The aim of this study was to update the clinical knowledge of this rare disease by a multi-center approach.
Methods: The study was conducted by the Kyoto University Hospital and Affiliated Facilities Head and Neck Clinical Oncology Group (Kyoto-HNOG). A total of 195 patients with parotid gland carcinoma who had been surgically treated with curative intent between 2006 and 2015 were retrospectively reviewed. Clinical results including overall survival (OS), disease-free survival (DFS), disease-specific survival (DSS), local control rate (LCR), regional control rate (RCR), and distant metastasis-free survival (DMFS) were estimated. Univariate and multivariate analyses were performed to identify prognostic factors.
Results: The median patient age was 63 years old (range 9–93 years), and the median observation period was 39 months. The OS, DFS, DSS, LCR, RCR, and DMFS at 3 years were 85%, 74%, 89%, 92%, 88%, and 87%, respectively. Univariate analysis showed age over 74, T4, N+, preoperative facial palsy, high grade histology, perineural invasion, and vascular invasion were associated with poor OS. N+ and high grade histology were independent factors in multivariate analysis. In subgroup analysis, postoperative radiotherapy was associated with better OS in high risk patients.
Conclusion: Nodal metastases and high grade histology are important negative prognostic factors for OS. Postoperative radiotherapy is recommended in patients with advanced high grade carcinoma.

1. Introduction

Although the parotid gland is the site most frequently affected by major salivary gland carcinoma, parotid gland carcinoma comprises only 1–4% of all head and neck cancers [1–2]. In Japan, the annual incidence of malignant tumor of the parotid gland was approximately 3 in 1,000,000 in 2014 [2]. A variety of histological types are observed in parotid gland carcinoma. A total of 24 histologies are listed in the 2005 World Health Organization (WHO) classification. Because of the rarity and variety of parotid gland carcinoma, it is difficult for a single institution to conduct clinical studies with an adequate number of cases. Longer time periods allow for an increase in the total number of included cases, but the results can be affected by changes in treatment practice over the study period. A multi-center approach is an effective method to overcome this problem. Because a large number of patients during a relatively short period can be enrolled, evaluation, including multivariate analyses, can be performed without being affected by changes in treatment method.

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The aim of this multi-center retrospective study was to update the clinical information regarding treatment results and prognostic factors of parotid carcinoma.

2. Materials and methods

The study was conducted by the Kyoto University Hospital and Affiliated Facilities Head and Neck Clinical Oncology Group (Kyoto-HNOG), to which a total of 12 tertiary care hospitals belong. A retrospective chart review was performed on patients with parotid gland carcinoma who had been surgically treated with curative intent between 2006 and 2015. Patients who received palliative treatment were excluded in this study. The database included information regarding patient characteristics, treatment modality, pathologic findings, and clinical outcomes. Clinical results including overall survival (OS), disease free survival (DFS), disease specific survival (DSS), local control rate (LCR), regional control rate (RCR), and distant metastasis free survival (DMFS) were estimated using the Kaplan-Meier method. LCR, RCR, and DMFS were calculated from the date of surgery to the date of detection of local, cervical, and distant recurrences, respectively. In order to identify prognostic factors, candidate factors were selected, which included age over 74, sex, T classification, N classification, preoperative facial palsy, high grade histology, pathological perineural invasion, pathological vascular invasion, and postoperative radiotherapy (PORT).

Three subgroup analyses were performed to evaluate the efficacy of prophylactic resection of the facial nerve in patients with cT1–3 disease, elective neck dissection (END) in patients with cN0 disease, and PORT in a high risk group.

In statistical evaluation, pairwise comparison between plotted curves was performed using the log-rank test. The Cox proportional hazard model was used in multivariate analyses. A p-value < 0.05 was considered to be statistically significant. Statistical analysis was performed with EZR (Saitama Medical Center, Jichi Medical University, Saitama, Japan), which is a graphical user interface for R (The R Foundation for Statistical Computing, Vienna, Austria). This study was approved by the institutional review board of every facility. Obtaining patient consent was waived by the review board due to the retrospective nature of this study. The study details were announced at every facility.

3. Results

3.1. Patient characteristics (Table 1)

A total of 217 patients with parotid gland carcinoma received initial treatment, of which 195 patients were treated surgically with curative intent and included in this study. Among the included 195 patients, 113 were male and 82 were female. The mean age at diagnosis was 59 years (range 9–93 years), and the median observation period was 35 months (1–128 months). The mean observation period of patients still alive at the end of the study was 39 months.

Preoperative facial palsy was present in 27 patients, 5 of whom had total palsy. The most common histology was mucoepidermoid carcinoma. High grade histology was as common as low grade histology. Nodal metastases were infrequent, and there were no patients with N3 disease.

The facial nerve was preserved in 119 patients and partially or totally resected in 76 patients. Therapeutic neck dissection was performed in 35 patients with clinically positive nodes (cN+), which showed pathologically positive nodes in 32 patients. END was performed in 54 of 160 patients with clinically negative necks (cN0), and occult metastases were found in 12 patients.

Postoperative adjuvant radiotherapy was performed in 82 patients, including 59 patients with high grade carcinoma and 23 patients with low to intermediate grade carcinoma.

Table 1
Patient characteristics.

Variable	No. of patients
Gender	
Male	113
Female	82
Age (years)	
Median (range)	59 (9–93)
Observation period (months)	
Median (range)	35 (1–128)
Preoperative facial nerve palsy	
Partial	22
Total	5
Fine needle aspiration cytology	
Class I–II	53
Class III	24
Class IV	24
Class V	52
Insufficient material	8
Not performed	34
Histology	
Mucoepidemoid carcinoma	48
Carcinoma ex-pleomorphic adenoma	25
Acinic cell carcinoma	21
Salivary duct carcinoma	21
Adenocarcinoma, NOS	16
Adenoid cystic carcinoma	16
Squamous cell carcinoma	15
Epithelial myoepithelial carcinoma	12
Cystadenocarcinoma	4
Basal cell carcinoma	3
Myoepithelial carcinoma	3
Mammary analogue secretory carcinoma	3
Undifferentiated carcinoma	3
Adenosquamous carcinoma	1
Carcinosarcoma	1
Clear cell carcinoma	1
Sebaceous carcinoma	1
Unclassified carcinoma	1
Histology, grade	
Low grade	81
Intermediate grade	28
High grade	86
Disease stage	
I	42
II	45
III	33
IVA	70
IVB	5
T classification	
T1	43
T2	48
T3	38
T4	66
N classification	
N0	149
N1	17
N2	29
N3	0
Surgery	
Parotid resection	
Partial	91
Total	104
Facial nerve resection	
Preserved	119
Partial	29
Total	47
Neck dissection	
Yes	106
No	89
Postoperative radiotherapy	
Yes	113
No	82

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