

Relationship between Paraglottic Space Invasion and Cervical Lymph Node Metastasis in Patients undergoing Supracricoid Partial Laryngectomy



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Introduction

Paraglottic space (PGS) is a connective tissue compartment of the larynx, and is deep to the true and false cords between the mucosa and the inner surface of the thyroid cartilage and contains fat and muscle. It may serve as a route of spread to other parts of the larynx, resulting in treatment failure. Transglottic cancer invading PGS is characteristically known to show a high incidence of laryngeal skeleton invasion and cervical metastasis. Supracricoid partial laryngectomy (SCPL) is a surgical technique used for en bloc resection of the thyroid cartilage, paraglottic space, and preepiglottic space with an oncological outcome comparable to a total laryngectomy.

The purpose of this study was to analyze the PGS invasion yield, and to determine the nature of the relations between these and cervical nodal metastases and disease specific survival in patients undergoing SCPL.

Materials and Methods

<Subjects>

The clinical and pathological data of 98 patients who were diagnosed with laryngeal carcinoma and underwent SCPL at the Department of Otolaryngology-HNS, The Catholic University of Korea, Seoul, Korea, from 1993 to 2010, were reviewed. We examined the relationship between PGS invasion and clinicopathological factors such as age, gender, tumor stage, vocal cord mobility, anterior commissure invasion, thyroid cartilage invasion, and subglottic extension.

<Histopathologic Examination>

The resected tissue was fixed in 10% formaldehyde, decalcified in 8% formic acid for 4 days, and embedded in paraffin. The surgical specimens were vertically or horizontally sectioned depending on the extent of tumor involvement.

<Statistical Analysis>

The chi-square test, Fisher's exact test, multiple logistic regression analysis, multiple linear regression analysis, and correlation analysis were used, as appropriate. The overall survival was determined using the Kaplan-Meier method. The Cox proportional hazard model with likelihood ratio statistics was used to further evaluate each variable by multivariate survival analysis. A $p < 0.05$ was considered statistically significant.

Results

< Demographic profiles and association with the paraglottic space invasion >

Parameters	No of cases (%)	Paraglottic space invasion (%)	p-value
age	≤59	43 (43.9)	0.160
	≥60	55 (56.1)	
gender	Male	95 (96.9)	0.060
	Female	3 (3.1)	
site	Glottis	82 (83.7)	0.318
	Transglottis	16 (16.3)	

Parameters	No of cases (%)	Paraglottic space invasion (%)	p-value
T classification	T1/T2	60 (61.2)	0.008*
	T3/T4	38 (38.8)	
N classification	N0	80 (81.6)	0.022
	N+	18 (18.4)	
Vocal cord mobility	Normal	46 (46.9)	0.001*
	Decreased/absent	52 (53.1)	
Preoperative irradiation	No	82 (83.7)	0.261
	Yes	16 (16.3)	
Anterior commissure invasion	No	43 (43.9)	0.252
	Yes	55 (56.1)	
Subglottic extension	No	71 (72.4)	0.014
	Yes	27 (27.6)	
Thyroid cartilage invasion	No	82 (83.7)	0.535
	Yes	16 (16.3)	

< Relationship between Paraglottic Space Invasion and Survival Rate>

The follow-up period ranged from 1 to 183 months, with a mean of 54.5 months. There was a 5-year disease-specific survival of 72%. The 5-year disease-specific survival among 59 patients with PGS invasion was 64%, whereas for the 39 PGS invasion-free patients it was 84%. However, this result did not reach statistical significance ($p = 0.118$).

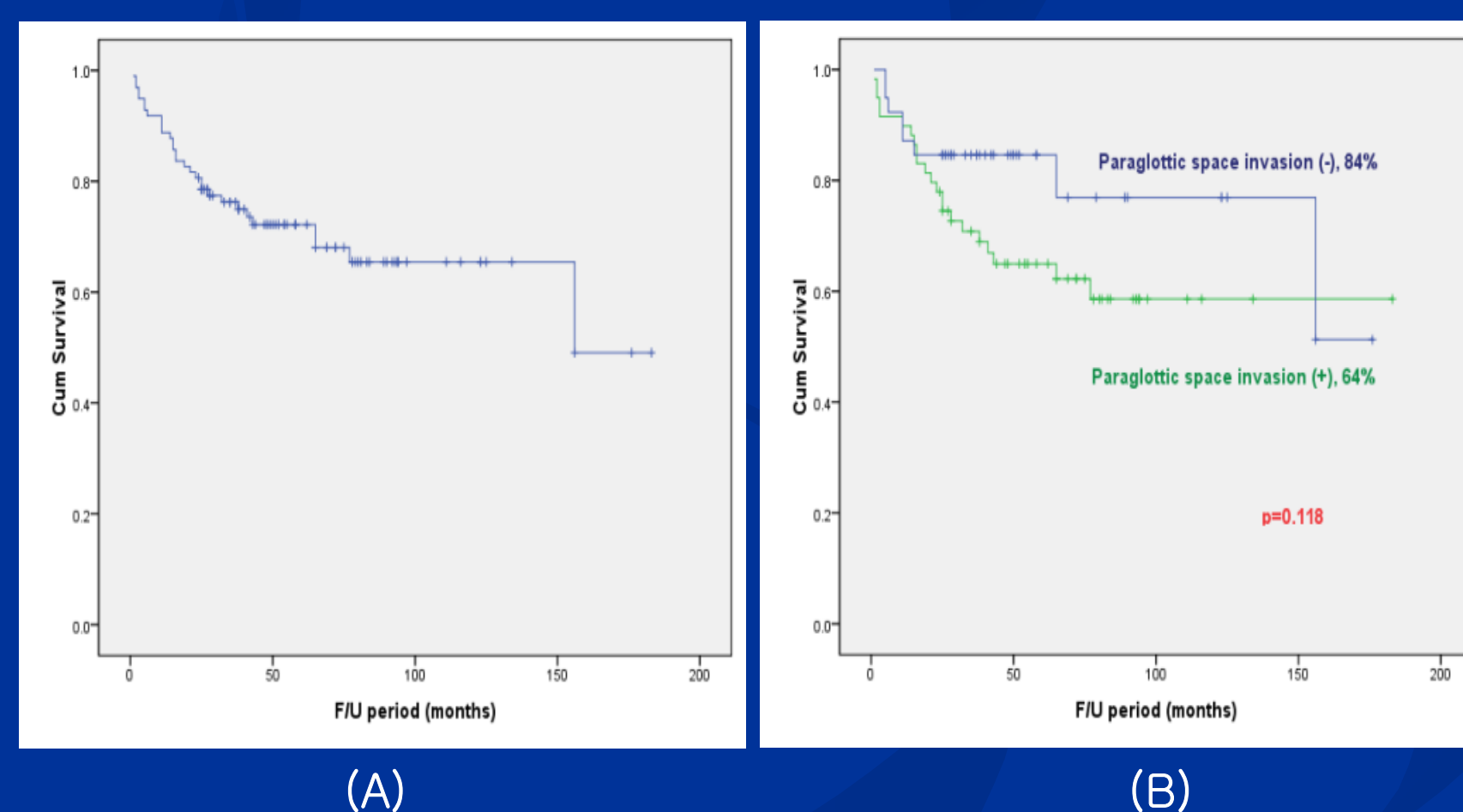


Figure. Kaplan-Meier disease-specific survival curve (A) and disease-specific survival curve according to the paraglottic space invasion (B)

Conclusion

In the present study, the PGS invasion was found to be significantly related to the presence of cervical lymph node metastasis, which suggests that could be used to predict the presence of lymph node metastasis and to determine operative extent and prognosis in patients undergoing SCPL.