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First bite syndrome – An 11-year experience

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ABSTRACT

Objective: First bite syndrome is the development of pain in the ipsilateral parotid region after the first few bites of food and can be seen after surgery of the upper cervical region. The aim of this study is to highlight the etiology of this potentially debilitating chronic pain syndrome.
Materials and methods: Retrospective review of 53 patients undergoing surgery of the upper neck between 2002 and 2013.
Results: FBS developed in 16 patients (30%). Partial resolution of FBS symptoms occurred in 69% and complete resolution in 12%, whereas 15% had no change. FBS was most common in the patients who had tumor arising from deep lobe of parotid gland in comparison with other sites (50% vs 18%, $p = 0.017$). FBS developed in 57% of patients undergoing external carotid artery (ECA) ligation and in 12.5% of patients in whom ECA was preserved ($p = 0.0008$). Among the patients in whom ECA was preserved, FBS developed in 43% of the patients in whom sympathetic chain was sacrificed and in 4% of the patients in whom sympathetic chain was preserved.
Conclusion: Present results further support the role of sympathetic chain in the development of FBS.

1. Introduction

First-bite syndrome (FBS) is a well-known but poorly understood postoperative complication of the parapharyngeal space (PPS) tumor. FBS presents as severe, sharp pain in the ipsilateral parotid region at the first bite of each meal. The pain characteristically lasts a few seconds, improves with subsequent masticatory movement, but recurs with following meals [1]. Substantial discomfort experienced during meals can often be great enough to deter patients from eating. Although often reported as a seemingly minor surgical complication, FBS can have a significant impact on both quality of life and physical health of the patients.

Surgeries involving extended dissection in the PPS are associated with multiple complications due to the complex neurovascular anatomy that traverses this region. The reasons of these complications such as vocal cord paralysis, palatal weakness, and Horner's syndrome are well described. However, the pathophysiology of FBS has not been definitively demonstrated. It is believed that selective sympathetic innervation to the parotid gland is either damaged or lost in the extensive dissection of the PPS where these fibers run.

FBS is a recognized complication of surgery within PPS. However, other surgical procedures involving the upper neck also have been reported to be associated with this syndrome [2,3]. Our aim of this study was to investigate the incidence, potential risk factors and outcomes of FBS following surgeries in upper neck including PPS, carotid space, retropharyngeal space, masticator space or pharyngeal mucosal space (PMS).

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2. Materials and methods

This is a retrospective observational study. Data of 53 patients undergoing surgery for PPS, carotid space, retropharyngeal space, masticator space or PMS between 2002 and 2013 at the Department of Otolaryngology-Head and Neck Surgery, Kobe University Hospital, were included in this study. Following institutional review board approval, the medical records were evaluated to determine patient age and sex, tumor locations, surgical details, histopathology findings and clinical characteristics of FBS. Operative reports were analyzed with specific attention on surgical approach and ligation and/or resection of the external carotid artery and the sympathetic chain. In patients developing FBS, location, the time of onset since surgery, duration of symptoms and treatment were noted.

All statistical analyses were performed using NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA). Univariate analysis of patient, treatment, and tumor covariates and FBS incidence was carried out using the independent samples *t* test, Pearson chi-square test and Fisher's exact test, with significance defined as $p < 0.05$. Significant covariates were then entered into a multivariate logistic regression model, to test the effects of risk factors on FBS.

3. Results

There were 21 females and 32 males with an average age of 53 years ranging from 17 to 77. The sites of origins of the tumors were as follows: 20 PPS, 18 carotid space, 10 retropharyngeal space, 4 PMS and one masticator space. Histopathological findings were 19 pleomorphic adenoma, 14 schwannoma, 7 lymph node metastasis of papillary thyroid carcinoma, 5 paraganglioma and 8 other tumors (lymph node metastasis of squamous cell carcinoma, benign cyst, carcinoma ex pleomorphic adenoma, meningioma, myoepithelial carcinoma, basal cell carcinoma and basal cell adenoma).

Of the 53 patients, 16 patients (30%) developed FBS. The most common location was PPS and the most common pathology was pleomorphic adenoma. Tumor factors significantly associated with the development of FBS were locations (Table 1: 50% in PPS vs 18% in others, $p = 0.017$). In our series, cervical approach was most common, utilized in 44 cases, whereas the cervical-parotid approach was used in 9 cases (Table 1). The sympathetic chain was resected in 8 cases, while external carotid artery was cut and ligated in 21 cases (Table 2). Most significant surgical factor associated with the development of FBS was external carotid artery ligation ($p = 0.0008$). Among the patients in whom ECA was preserved, FBS

Table 1
The patients characteristics, tumor location, histopathology and FBS incidence.

	N	No FBS	FBS	*p*
		n (%)	*n* (%)	
Total	53	37 (69.8)	16 (30.2)	
Age (years), mean ± sd		49.43 ± 18.14	53.13 ± 13.13	[a]0.466
Gender				
Male	21	15 (71.4)	6 (28.6)	[b]0.252
Female	32	12 (54.5)	10 (45.5)	
Site of origin				
PS	20	10 (50.0)	10 (50.0)	[b]0.014*
CS	18	13 (72.2)	5 (27.7)	
RS	10	10 (1.0)	0 (0)	
MS	1	1 (1.0)	0 (0)	
PMS	4	3 (75.0)	1 (25.0)	
Histopathology				
PA	19	10 (52.6)	9 (47.4)	[b]0.042*
Schwaannoma	14	11 (78.5)	3 (21.4)	
LNMPTC	7	7 (1.0)	0 (0)	
Paraganglioma	5	3 (60.0)	2 (40.0)	
Others	8	6 (75.0)	2 (25.0)	
Approach				
CA	44	29 (65.9)	15 (34.1)	[c]0.248
CPA	9	8 (88.9)	1 (11.1)	
ECA treatment				
Sacrifice	21	9 (42.9)	12 (57.1)	[b]0.001*
Preserve	32	28 (87.5)	4 (12.5)	
Sympathetic treatment				
Sacrifice	8	5 (62.5)	3 (37.5)	[c]0.685
Preserve	45	32 (71.1)	13 (28.9)	

PS, pharyngeal space; CS, carotid space; RS, retropharyngeal space; MS, masticator space; PMS, pharyngeal mucosal space; PA, pleomorphic adenoma; LNMPTC, lymph node metastasis of papillary thyroid cancer; CA, cervical approach; CPA, cervical-parotid approach; ECA, external carotid artery.
[a] Independent samples *t* test.
[b] Pearson chi-square test.
[c] Fisher's exact test.
* $p < 0.05$.

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