Survival Difference Between Advanced Oral Cavity Squamous Cell Carcinoma Treated with Surgery versus Definitive Chemoradiation

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Introduction

Surgery remains the mainstay of treatment for locally advanced oral cavity squamous cell carcinomas (OCSCC) with primary chemoradiation (CRT) historically reserved for patients declining surgery or with significant surgical co-morbidities.[1-6] Primary CRT offers an opportunity for organ-preservation if surgery can be avoided in these cases.[4-6]

The evidence on survival in patients undergoing upfront surgery versus primary CRT is mixed. [1-6] At the University of Chicago our patient undergoes treatment with primary CRT for advanced OCSCC at a higher rate than the literature. This observation prompted us to conduct a retrospective analysis of The National Cancer Database (NCDB) to further evaluate the treatment of advanced stage OCSCC. The aim of this study was to evaluate the overall survival (OS) of patients with T3 or T4 OCSCC who underwent surgery with or without induction chemotherapy versus definitive CRT.

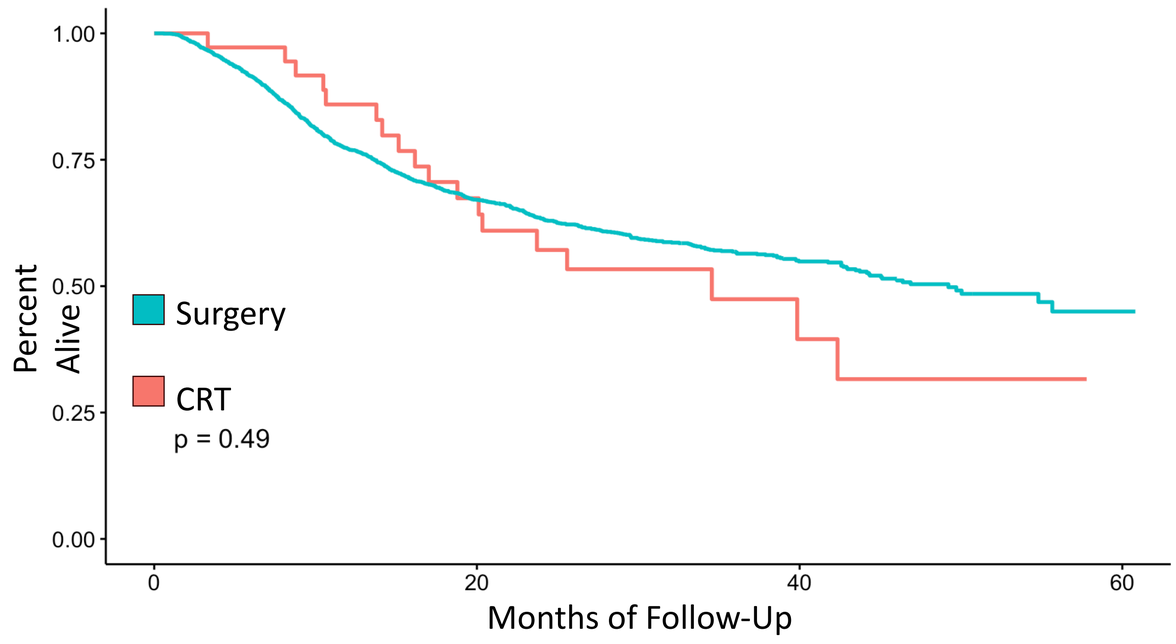
Methods

Use of the NCDB was deemed exempt from review by the University of Chicago Institutional Review Board. A retrospective cohort study of patients diagnosed with OCSCC from 2004 to 2020 was conducted using the National Cancer Database (NCDB). The database was queried for patients of all ages diagnosed with SCC of any oral cavity subsite. Primary tumors staged T3 or T4 were included. Patients were stratified to surgery upfront (with or without induction chemotherapy) or definitive CRT. Descriptive, univariable, multivariable, and survival analysis were performed in R version 4.3.0.

Table 1: Clinical Characteristics Stratified by Treatment Modality

		Surgery	Primary CRT	p
n		1876	36	
Age	<50 years	227 (12.1)	4 (11.1)	0.89
	50-60 years	522 (27.8)	10 (27.8)	
	60-70 years	604 (32.2)	10 (27.8)	
	>70 years	523 (27.9)	12 (33.3)	
Sex	Male	1208 (64.4)	21 (58.3)	0.57
	Female	668 (35.6)	15 (41.7)	
Race	Asian	41 (2.2)	0 (0.0)	0.18
	Black	153 (8.2)	5 (13.9)	
	White	1545 (82.4)	31 (86.1)	
	Other	136 (7.2)	0 (0.0)	
Insurance	Government	1171 (62.4)	24 (66.7)	0.39
	Private	612 (32.6)	12 (33.3)	
	Uninsured/Unknown	93 (5.0)	0 (0.0)	
Location	Metro	1456 (80.3)	32 (94.1)	0.13
	Urban	322 (17.8)	2 (5.9)	
	Rural	36 (2.0)	0 (0.0)	
AJCC Clinical T Stage	cT3	36 (100.0)	837 (44.6)	<0.001
	cT4	0 (0.0)	208 (11.1)	
	cT4a	0 (0.0)	771 (41.1)	
	cT4b	0 (0.0)	60 (3.2)	
AJCC N Stage	N0	775 (41.8)	11 (55.0)	0.003
	N1	240 (12.9)		
	N2	388 (20.9)	9 (45.0)	
	N3	451 (24.3)		

Figure 1: Survival by Treatment Modality

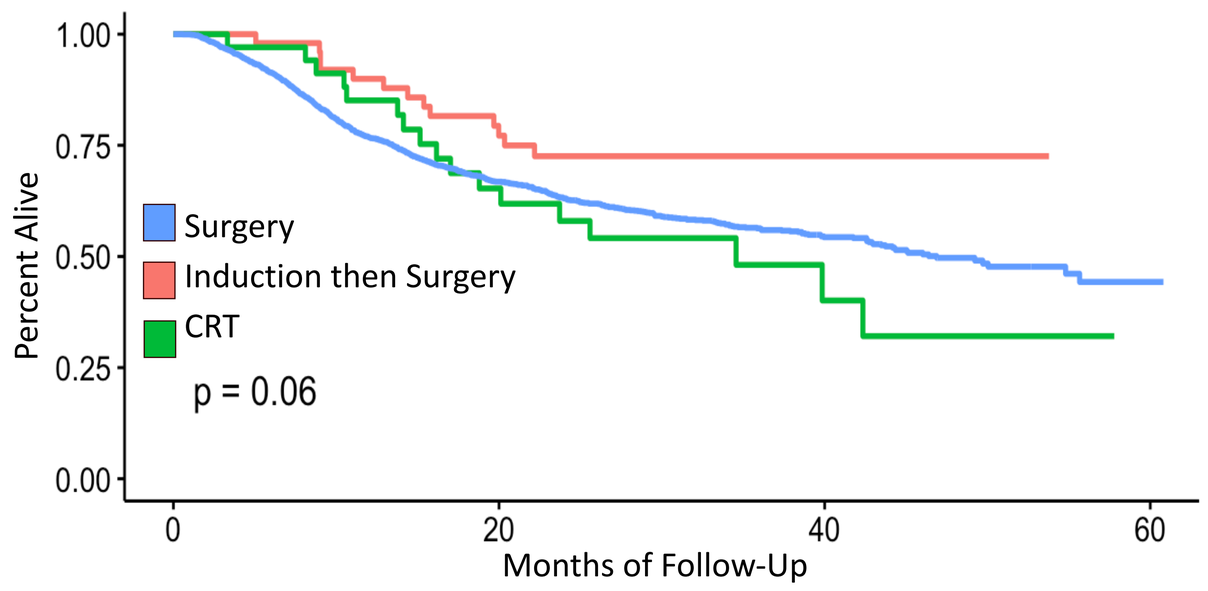


Results

Table 1 summarizes key demographic information and tumor characteristics by treatment modality. 1912 patients with advanced stage (T3/T4) OCSCC were identified (mean [SD] age, 64.0 [11.3] years; 1229 [64.3%] male; 1576 [82.4%] white). The AJCC nodal staging was significantly different between treatment groups.

There was no difference in 3-year overall survival (OS) between the upfront surgery (56.8% [54.3-59.3%]) and definitive CRT (47.4% [27.8-64.8%]) groups, P=0.49 (Figure 1). Figure 2 shows OS with breakdown of induction chemotherapy followed by surgery, upfront surgery, and definitive CRT. Multivariate cox regression analysis controlling for age, sex, comorbidities, and tumor stage did not demonstrate any difference in OS between patients treated with upfront surgery compared to those who received induction followed by surgery (HR 0.64 [0.35-1.16], p=0.14) or definitive CRT (HR 1.23 [0.63-2.39], p=0.55).

Figure 2: Survival by Treatment Modality with Induction



Discussion / Conclusions

Our study found no difference in survival between patients receiving upfront surgery or definitive CRT for advanced OCSCC. We specifically focused on T3/T4 primary tumors as larger tumors may be more amenable to organ preservation with definitive CRT. It is important to continue to explore alternative and adjunct treatments options for locally advanced OCSCC because surgery in these scenarios can lead to devastating cosmetic and functional outcomes.[4] These may be further exacerbated when surgery is combined with adjuvant CRT. However, with our search criteria, we were only able to identified a limited definitive CRT cohort. Additional limitations include retrospective nature and heterogeneity in the coding of the NCDB database.

Definitive CRT can be considered as an alternative to surgery in T3/T4 OCSCC without significant compromise on survival. Further research is needed as induction chemotherapy is further integrated into treatment protocols and the role and timing of immunotherapy continues to evolve.

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