IMAGING VS CLINICAL DETECTION OF RECURRENT ORAL CANCER

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Background

More than 90% of all head and neck cancer is a form of squamous cell carcinoma (1). Worldwide over the last 10 years head and neck cancer cases have been on the risk. The incidence of lip and oral cancers has risen 36.5%; larynx cancer has increased by 23.1%; other pharynx cancers have increased by 29.9% (2). With 63,000 cases per year and 13,000 deaths per year, head and neck squamous cell carcinoma comprises roughly 3% of all cancers in the United States (3).

Oral cavity squamous cell carcinoma is primarily treated with primary surgery, with or without adjuvant therapy based on pathologic risk factors (4). The optimal method for surveillance in oral cavity squamous cell carcinoma is debated, with no official National Comprehensive Cancer Network guidelines for asymptomatic patients >6 months post-surgery (5). Recommendations for ongoing imaging for surveillance are vague and imprecise, resulting in a significant amount of variability amongst providers and institutions. In 2018, the American College of Radiology introduced the Neck Imaging Reporting Data System (NI-RADS) as a proposed framework that can be applied to an institutional surveillance imaging protocol (6).

It is controversial whether ongoing routine imaging surveillance provides any benefits above clinical surveillance with imaging only for changes in exam or symptoms. Our institution has instituted a protocol whereby imaging is routinely obtained every 6 months for the first two years.

Purpose

To perform a single-center retrospective evaluation of patients who underwent oral cavity squamous cell carcinoma resection with subsequent cancer recurrence, focusing on the efficacy of routine post-surgical imaging in detecting recurrence.

Materials and Methods

Institutional review board-approved retrospective review of the electronic medical records of all patients who underwent surgical resection of primary oral cavity squamous cell carcinoma at Emory University from 2011-2016 (n=203). Pertinent demographics, risk factors, clinical and pathologic staging, pathologic data, clinical course, and up to 27-month post-surgical imaging surveillance were recorded. Exclusion criteria included prior treatment of head and neck cancer, <18 years of age, or distant metastatic disease at presentation. Statistical analysis was performed on this dataset.

Results

- 50 patients developed recurrence for an overall recurrence rate of 24.6%
- 31 (62%) recurrences were detected by clinical symptoms or exam
- 19 (38%) recurrences were occult and only detected on routine imaging
- 76% of recurrences involved local and/or regional disease
- Median time to recurrence was 9 months
- 24% of patients recurred >24 months after treatment

Average Age	62.1	
Sex		
	Male	112 (55%)
	Female	91 (45%)
Tobacco		
	Y	133 (72%)
	N	71 (38%)
	UNK	1 (<1%)
EtOH		
	Y	113 (56%)
	N	89 (44%)
	UNK	1 (<1%)
Path T Stage		
	T1	72 (35%)
	T2	49 (24%)
	T3	3 (1%)
	T4	80 (39%)
	UNK	1 (<1%)
Path N Stage		
	NX	16 (11%)
	N0	59 (43%)
	N1	7 (5%)
	2a	1 (<1%)
	2b	6 (4%)
	2c	3 (2%)
	N3	0 (0%)
	UNK	60 (39%)

Table 1. Demographics

Subsite		
	Oral Tongue	111 (54%)
	RMT	4 (2%)
	FOM	33 (16%)
	Buccal	10 (5%)
	Maxilla	16 (8%)
	Mandible	33 (16%)
Neck Dissection		
	None	38 (19%)
	Elective ND	106 (52%)
	Therapeutic ND	60 (30%)
Perineural Invasion		
	Y	102 (50%)
	N	98 (48%)
	UNK	4 (2%)
LVI		
	Y	47 (23%)
	N	149 (73%)
	UNK	8 (4%)
Differentiation		
	Well	55 (31%)
	Moderate	95 (54%)
	Poor	20 (11%)
	UNK	6 (3%)
ECS		
	Y	45 (31%)
	N	101 (69%)

Table 2. Demographics cont.

	Total		Clinical Detection		Radiographic Detection	
	N	%	N	%	N	%
Age						p=0.607
18-60	24	48%	14	54.8	10	52.6
>60	26	52%	17	45.2	9	47.4
Sex						p=0.879
Male	27	54	17	45.2	10	52.6
Female	23	46	14	54.8	9	47.4
Stage						p=0.093
I/II	26	52	19	61.2	7	36.8
III/IV	24	48	12	38.8	12	63.2
PNI						p=0.610
Yes	32	64	19	61.2	13	68.4
No	18	36	12	38.8	6	31.6
LVI						p=0.109
Yes	10	20	4	12.9	6	31.5
No	40	80	27	87.1	13	68.5
ECE						p=0.103
Yes	11	29.7	4	19	7	43.7
No	26	70.3	17	81	9	56.3
Adjuvant						p=0.182
Yes	31	62	17	54.8	14	73.6
No	19	38	14	45.2	5	26.4

Table 3. Univariate analysis of methods of detection

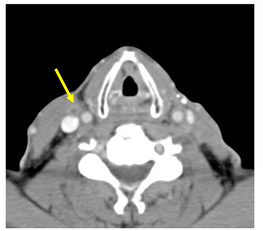

Figure 1. Contrast-enhanced CT scan highlighting the importance of ongoing routine imaging. An occult contralateral 7mm nodal metastasis (yellow arrow) identified 29 months after treatment. Patient was successfully salvaged with minimal morbidity due to early detection.

Conclusion

This study highlights several important aspects regarding detecting recurrent oral cavity cancer. Previous studies have suggested that most recurrent disease will be detected on clinical exam only, but if no routine surveillance imaging in those studies is obtained, then it is natural that all will be detected clinically. Given that 38% of patients had recurrent disease detected on imaging in the absence of concerning clinical changes, we suggest that routine imaging be incorporated into standard post-operative surveillance recommendations. While not evaluated in this study, detecting recurrent disease prior to it becoming clinically evident would allow salvage treatment earlier and potentially leading to less morbidity and improved survival for the patient. The high rate of recurrent disease diagnosed 24 months after treatment highlights the importance of ongoing surveillance as well.

References

1. Stewart BW, Wild C, eds. World Cancer Report. Lyon, France: International Agency for Research on Cancer; World Health Organization; 2014
2. Simard EP, Torre LA, Jemal A. International trends in head and neck cancer incidence rates: differences by country, sex and anatomic site. Oral Oncol. 2014 May;50(5):387-403. doi: 10.1016/j.oraloncology.2014.01.016. Epub 2014 Feb 13. PMID: 24530208.
3. Siegel RL, Miller KD, Jemal A. Cancer Statistics, 2017. CA Cancer J Clin. 2017 Jan;67(1):7-30. doi: 10.3322/caac.21387. Epub 2017 Jan 5. PMID: 28055103.
4. Cook JA, Jones AS, Phillips DE, Soler Lluch E. Implications of tumour in resection margins following surgical treatment of squamous cell carcinoma of the head and neck. Clin Otolaryngol Allied Sci. 1993 Feb;18(1):37-41. doi: 10.1111/j.1365-2273.1993.tb00807.x. PMID: 8448889.
5. Wierzbicka M, Napierała J. Updated National Comprehensive Cancer Network guidelines for treatment of head and neck cancers 2010-2017. Otolaryngol Pol. 2017 Dec 30;71(6):1-6. doi: 10.5604/01.3001.0010.7193. PMID: 29327681.
6. Aiken AH, Rath TJ, Anzai Y, Branstetter BF, Hoang JK, Wiggins RH, Juliano AF, Glastonbury C, Phillips CD, Brown R, Hudgins PA. ACR Neck Imaging Reporting and Data Systems (NI-RADS): A White Paper of the ACR NI-RADS Committee. J Am Coll Radiol. 2018 Aug;15(8):1097-1108. doi: 10.1016/j.jacr.2018.05.006. Epub 2018 Jul 6. PMID: 29983244.