



Skip Metastasis and Patterns of Nodal Disease in Oral Cavity Squamous Cell Carcinoma

Adwight Risbud, BS; Jonathan C. Pang, BA; Dean Chung, BA; Milind Vasudev, BS;

Mehdi Abouzari, MD, PhD; Yarah M. Haidar, MD; William B. Armstrong, MD; Tjason Tjoa, MD

Department of Otolaryngology—Head & Neck Surgery, University of California, Irvine

Abstract

Objectives: To report the rate of skip metastasis and nodal spread in our patients with N0 oral cavity squamous cell carcinoma (OCSCC) and to compare surgical outcomes of complete versus elective selective neck dissection.

Methods: We conducted a retrospective review of all patients with OCSCC who underwent neck dissection (ND) at our hospital from 2007-2019. Total number of lymph nodes (LN) yielded from the dissection, number of levels dissected, and positive lymph nodes were collected from surgical pathology. Additional clinicopathologic data was collected from patients' medical records. We calculated the rate of skip metastasis in our cohort and analyzed surgical outcomes based on patient and tumor characteristics between patients who underwent complete versus elective selective ND, as well as those with and without skip metastasis.

Results: A total of 151 patients were included in the analysis with a mean age of 62 years at the time of surgery. The most common primary tumor site and involved neck levels were oral tongue (52.4%) and levels I-II (18.8%-25.9%). Complete ND was performed in 40.6% of patients and the rate of skip metastasis was 10.1%. There were no differences in disease-free survival (DFS), recurrence, length of stay (LOS) or post-op complications between patients with complete and elective selective ND.

Conclusion: Although the rate of skip metastasis may be higher than previously reported, its presence does not confer survival benefit nor neck recurrence. Elective supraomohyoid neck dissection continues to remain safe and adequate for patients with N0 OCSCC.

Contact

Tjason Tjoa, MD
Department of Otolaryngology—Head & Neck Surgery
University of California, Irvine
101 The City Drive South, Building 56, Suite 500
Orange, CA 92868
Email: tjoat@hs.uci.edu

Introduction

- Supraomohyoid neck dissection is widely deemed sufficient for patients with N0 oral cavity squamous cell carcinoma (OCSCC).¹⁻⁴
- However, studies have reported the phenomenon of “skip metastases” in which levels I-III appear disease free, while levels IV-V contain positive nodes.^{1,3,4}
- Though the oncologic safety of elective selective neck dissection has been supported in the literature, the prevalence and prognostic significance of skip metastases has not yet been established.
- Given that nodal metastasis is the most important prognostic factor in OCSCC, there is benefit in determining the rate of nodal metastases outside levels I-III in patients undergoing elective neck dissection.

Materials and Methods

- Following institutional review board approval, we conducted a retrospective review of all patients with OCSCC who underwent neck dissection (ND) at our institution from 2007-2019.
- Total number of lymph nodes (LN) yielded from the dissection, number of levels dissected, and positive lymph nodes were collected from surgical pathology.
- Additional clinicopathologic data was collected from patients' medical records.
- We calculated the rate of skip metastasis (defined as positive LNs in levels IV-V without level I-III involvement) in our cohort.
- Chi-square and analysis of variance were performed to determine patient and tumor characteristics that are associated with and may be predictive of skip metastases, and to compare differences in surgical outcomes between patients with and without skip metastases and complete versus elective selective ND.

Figure 1. Distribution of nodal metastasis by neck level.

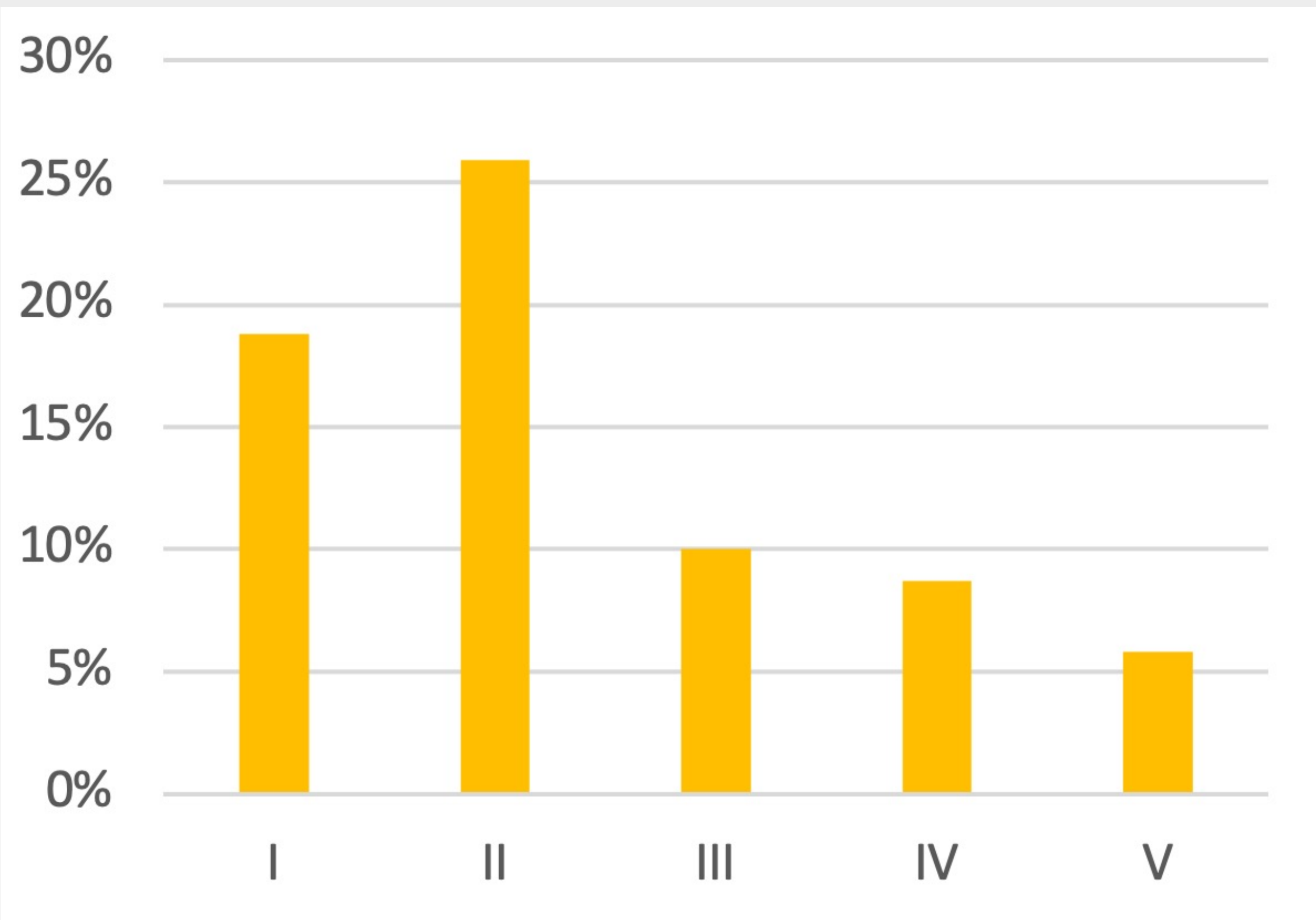


Table 1. Patterns of nodal metastasis in OCSCC patients.

Neck Level	I	II	III	IV	V	Total
Metastasis (%)	18.8	25.9	10	8.7	5.8	--
Avg. LN yield	5.8	11.5	10.3	10.1	6.8	36.5
Avg. # Positive LNs	0.4	0.9	0.2	0.1	0.2	2.3

Results

- A total of 151 patients were identified with 172 NDs performed.
- Mean age at surgery and LOS were 62 years and 9.7 days, respectively.
- The most frequent primary tumor sites were oral tongue (52.4%), followed by alveolar ridge (17.1%) and buccal mucosa/floor of mouth (each 11.8%).
- Complete ND was performed in 40.6% of patients and skip metastases were present in 10.1% of those patients.
- For patients who underwent complete ND, rates of Level IV and V metastasis were 8.7% and 5.8%, respectively (**Figure 1**).
- Average LN yield and number of positive nodes per dissection were 36.5 and 2.3, respectively (**Table 1**).
- DFS, neck recurrence, LOS, and post-op complication rates were not significantly different between patients with and without skip metastases, nor between patients who underwent complete and elective selective ND (all $p>0.05$).
- LOS was significantly higher (14.1 vs. 8.6 days) in patients who underwent bilateral ND versus unilateral ND ($p=0.003$).
- Patients with Level III metastasis were significantly less likely to have skip metastasis (OR: 0.13, 95% CI: 0.0.3-0.46, $p=0.04$).

Conclusions

- The rate of skip metastases at our institution is higher than previously reported in the literature.⁴
- Predicting the presence of skip metastases in patients with N0 OCSCC remains a challenge.
- Although a higher proportion of skip metastases may be missed with selective dissection, our results indicate no survival benefit or lower neck recurrence between patients with or without skip metastases.
- Additionally, given no differences in survival, recurrence, or LOS/post-op complications for patients who undergo complete versus elective selective ND, our study adds further support for less extensive neck management (supraomohyoid) for N0 OCSCC.

References

- Feng, Zhen, et al. "Supraomohyoid neck dissection in the management of oral squamous cell carcinoma: special consideration for skip metastases at level IV or V." *Journal of Oral and Maxillofacial Surgery* 72.6 (2014): 1203-1211.
- De Zino, Luca Oscar Rodella, et al. "Prevalence and localization of nodal metastases in squamous cell carcinoma of the oral cavity: role and extension of neck dissection." *European Archives of Otorhinolaryngology and Head & Neck* 263.12 (2006): 1131-1135.
- Huang, Shang-fu, et al. "Neck treatment of patients with early stage oral tongue cancer: comparison between observation, supraomohyoid dissection, and extended dissection." *Cancer: Interdisciplinary International Journal of the American Cancer Society* 112.3 (2008): 1066-1075.
- Guo, Chuan Bin, et al. "Supraomohyoid neck dissection and modified radical neck dissection for clinically node-negative oral squamous cell carcinoma: a prospective study of prognosis, complications and quality of life." *Journal of Cranio-Maxillofacial Surgery* 42.8 (2014): 1885-1890.
- Warshawsky, Anton, et al. "Assessment of the rate of skip metastasis to neck level IV in patients with clinically node-negative neck oral cavity squamous cell carcinoma: a systematic review and meta-analysis." *JAMA Otolaryngology—Head & Neck Surgery* 145.6 (2019): 542-548.