



# Postoperative Radiotherapy in Advanced Stage Squamous Cell Carcinoma Requiring Maxillectomy

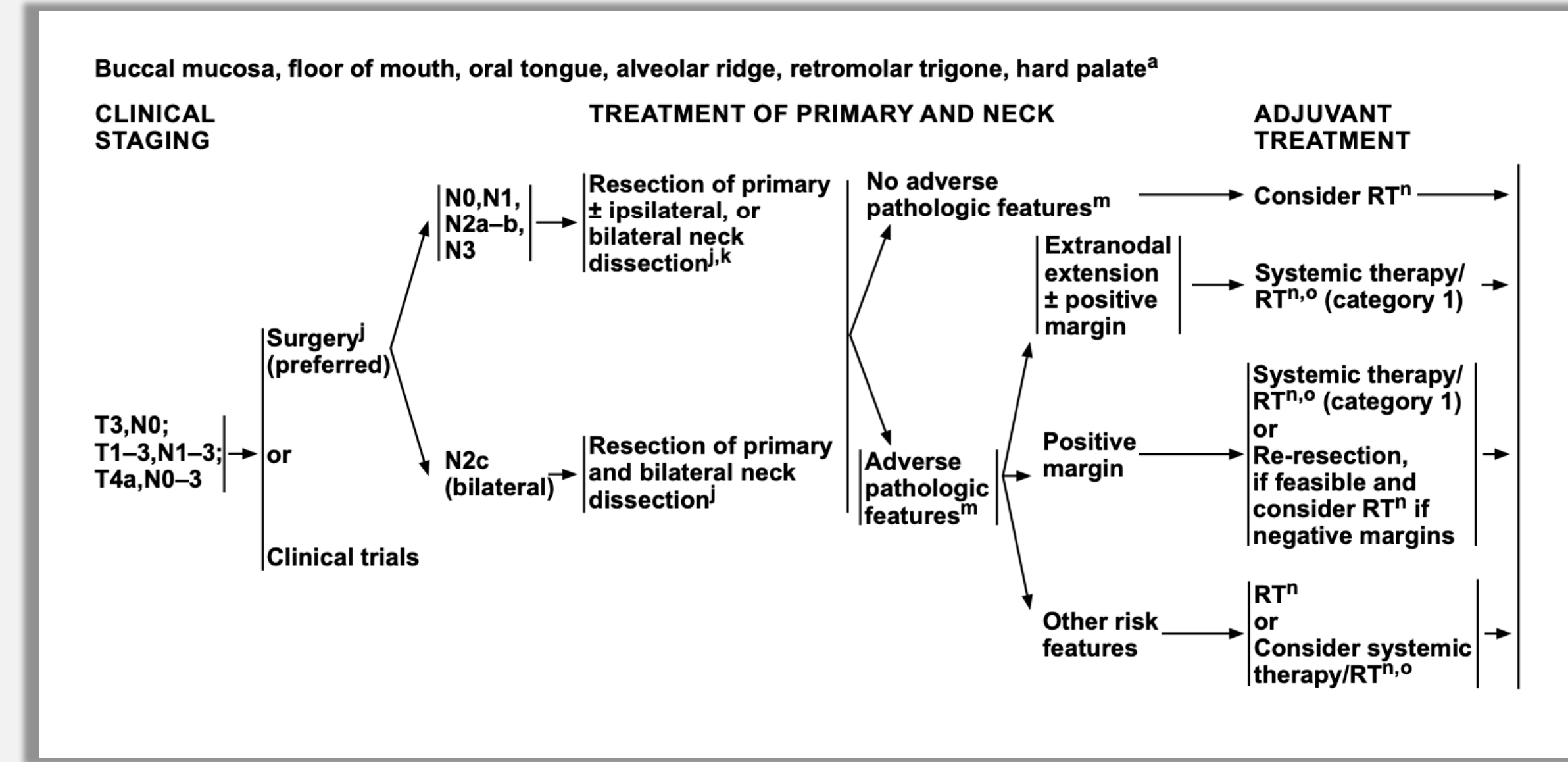


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## Introduction

- In oral cavity squamous cell carcinoma (OCSCC), **invasion of maxilla upstages a tumor to T4a regardless of size.**
- Guidelines for administration of post-operative radiotherapy (PORT) account for tumor stage but not tumor size.
- Currently, there are no studies that use tumor size as a metric for treatment
- Objective:** To evaluate whether the benefit of PORT changes with respect to tumor size among patients who received maxillectomy for pT4aNO OCSCC.

**Figure 1:** NCCN Guidelines Version 1.2023 – Cancer of the Oral Cavity. Patients with pT4aNO oral cavity disease without other adverse features are recommended to consider radiotherapy. There are currently no prospective or randomized studies within this population to further guide treatment recommendations.



**Table 1. Demographics**

Variables	n = 416
Age, y, mean (SD)	71.5 (11.3)
Gender, n (%)	
Male	190 (45.7)
Female	226 (54.3)
Race, n (%)	
White	340 (81.7)
Black	24 (5.8)
Hispanic	29 (7)
Asian	16 (3.8)
Unknown	7 (1.7)
Insurance Status, n (%)	
Private Insurance	105 (25.2)
Medicare/Medicaid	298 (71.6)
No Insurance	11 (2.7)
Unknown	2 (0.5)

Note. y=years; n=sample size; SD=standard deviation.

**Table 2. Clinical Characteristics**

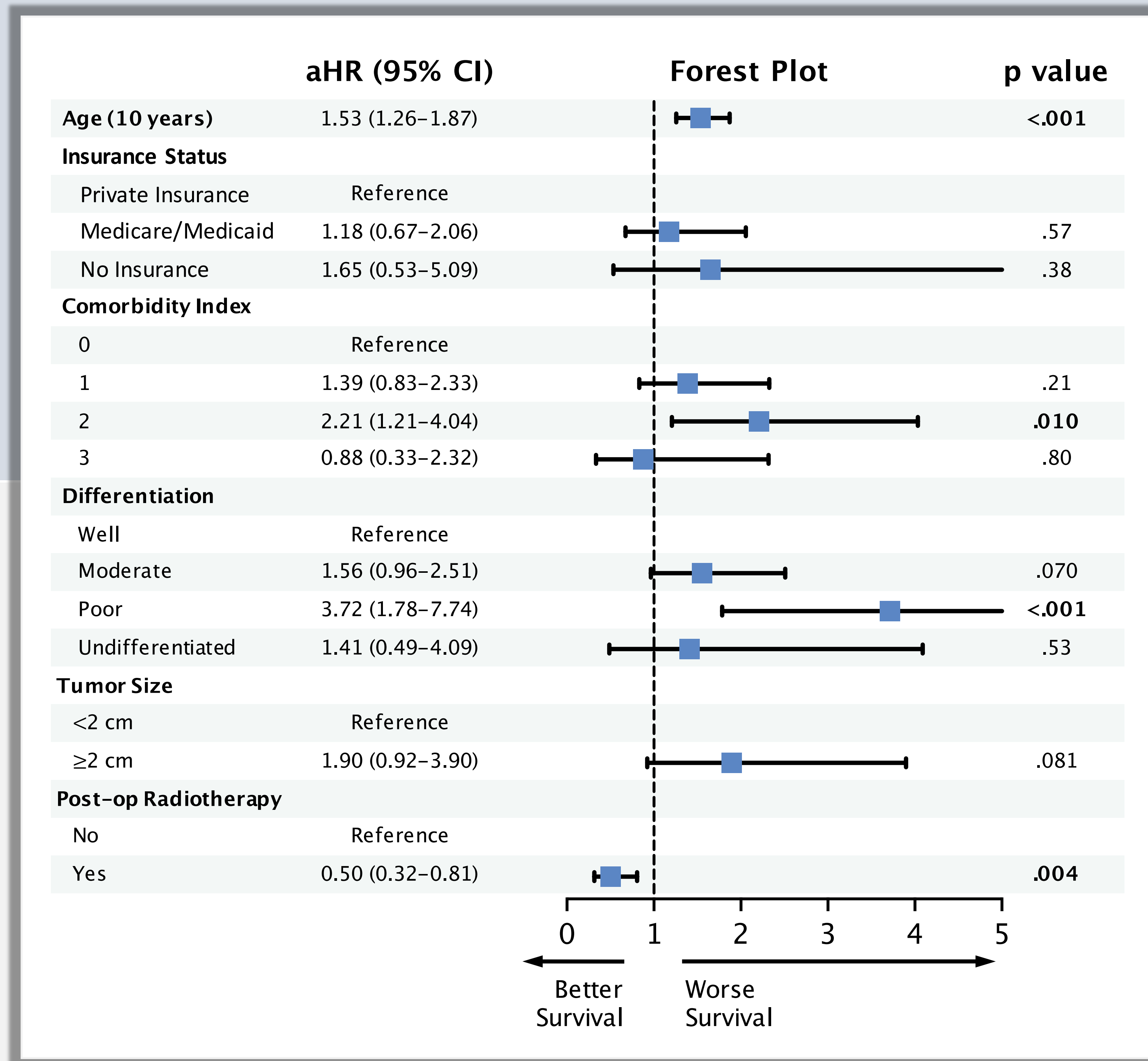
Variables	n = 416
Charlson Comorbidity Index, n (%)	
0	285 (68.5)
1	88 (21.2)
2	25 (6)
3	18 (4.3)
Tumor Grade, n (%)	
Well Differentiated	106 (25.4)
Moderately Differentiated	195 (46.9)
Poorly Differentiated	42 (10.1)
Undifferentiated	4 (1)
Unknown	69 (16.6)
Tumor Size, n (%)	
<2 cm	54 (13)
≥2 cm	362 (87)
Post-operative Radiotherapy, n (%)	
No	211 (50.7)
Yes	205 (49.3)

Note. n=sample size.

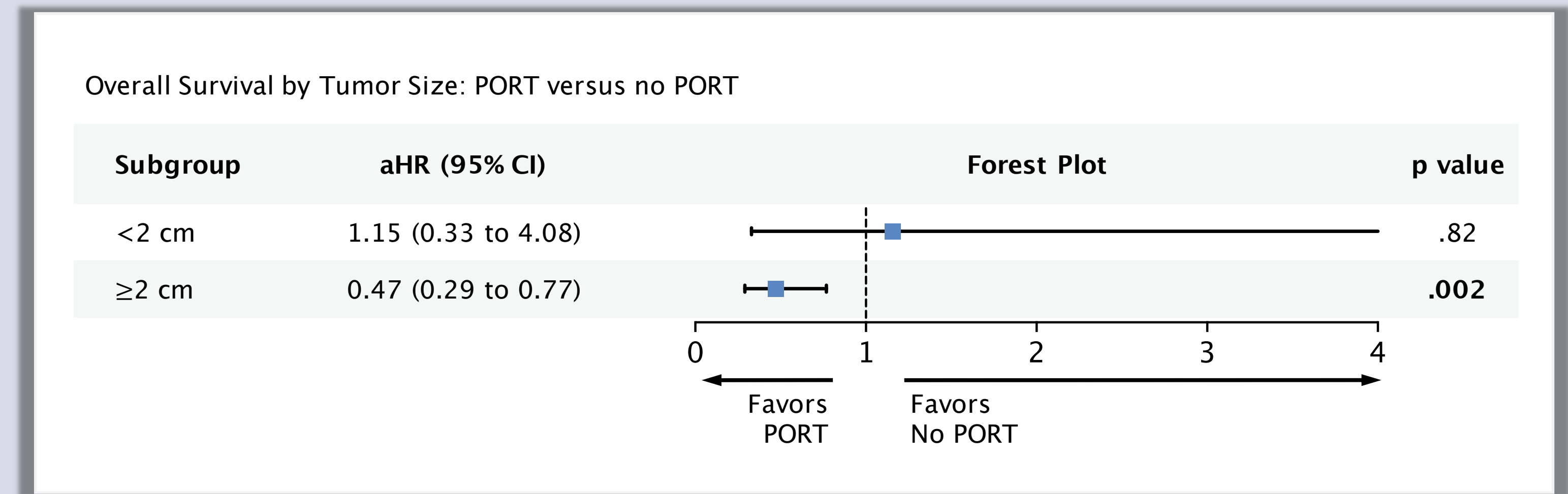
## Methods

- National Cancer Data Base
- 2004 through 2019
- Margin negative **maxillectomy** and neck dissection for **pT4aNO OCSCC**
- Inverse probability weighting to balance covariates between treatment groups
- Evaluated survival with a multivariable Cox proportional hazards regression
- A priori post-hoc subgroup analysis to **evaluate the impact of PORT on survival with respect to tumor size**

**Figure 2:** Weighted multivariable Cox proportional hazards regression displaying risk factors for survival among patients who received maxillectomy for pT4aNO OCSCC. Included variables with p<.1 on univariate analysis.



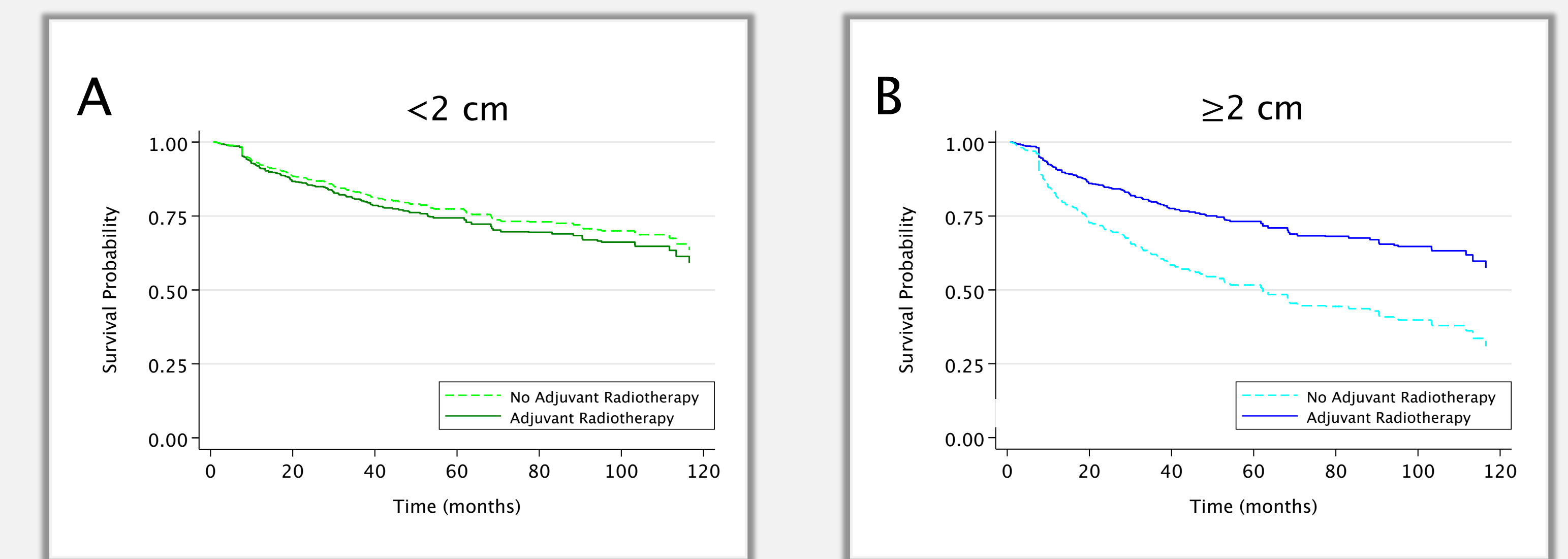
**Figure 3:** Post-hoc subgroup analysis with the cohort stratified by tumor size (<2cm and ≥2 cm). Within each size group, survival among patients who received PORT is compared with survival for those who did not receive PORT. In this model there is no statistical comparison between size groups, however, we can compare the relative benefit of PORT within each group.



## Results

- Included **416 patients** with pT4aNO oral cavity SCC with invasion of the maxilla
- Mean Age 71.5 years (SD 11.3; Table 1)
- 49.3% of cohort received PORT** (Table 2)
- Tumors ≥2 cm demonstrate trend towards worse survival (Figure 2)
- 50% improvement in survival among patients who received PORT (Figure 2)
- PORT is significantly associated with improved survival for tumors ≥2 cm**, but is not associated with survival for tumors <2cm (Figure 3)

**Figure 4:** Weighted multivariable Cox proportional hazards survival curves, stratified by tumor size, comparing survival distributions for patients who received PORT with those who did not receive PORT.

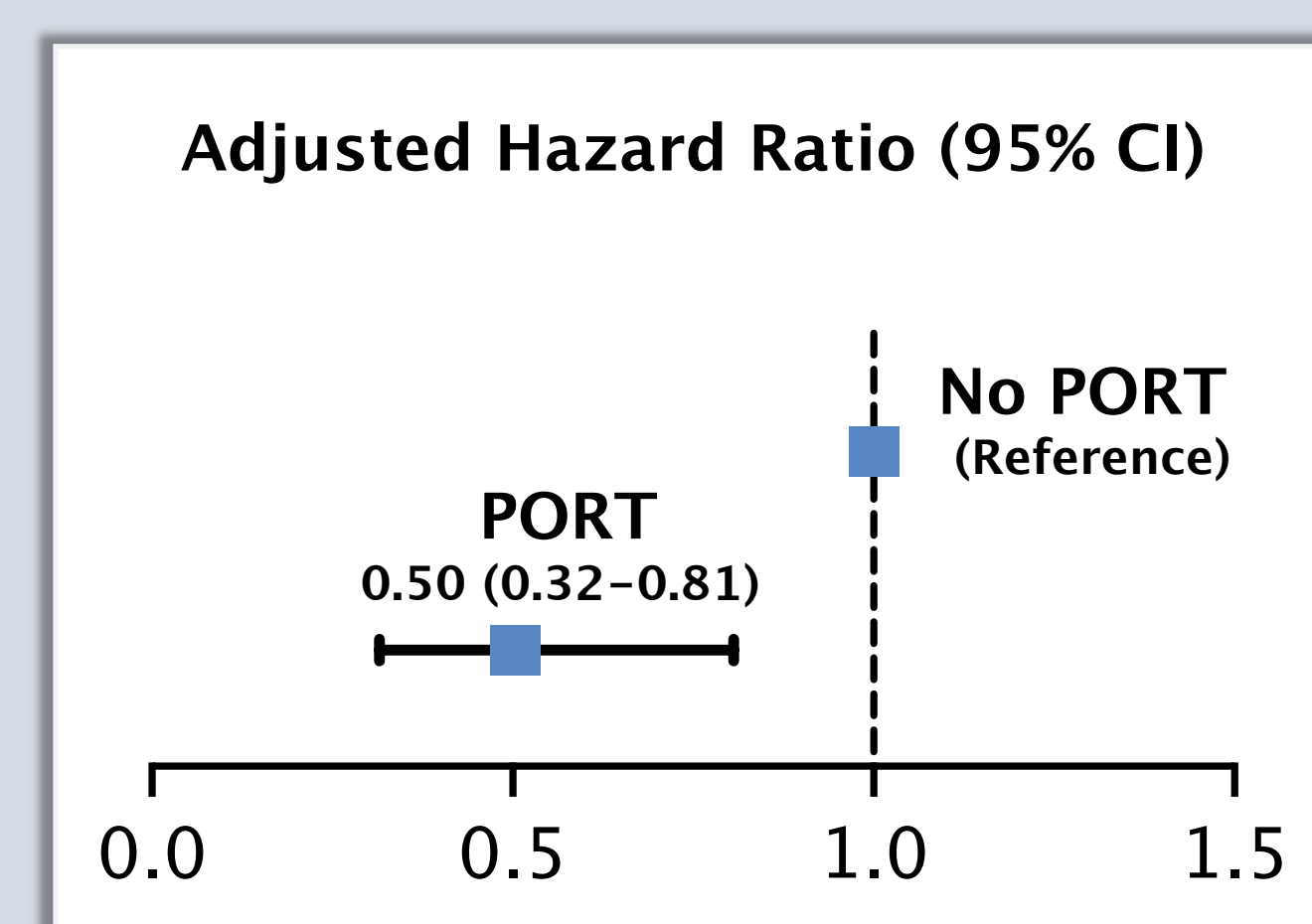


## Conclusion

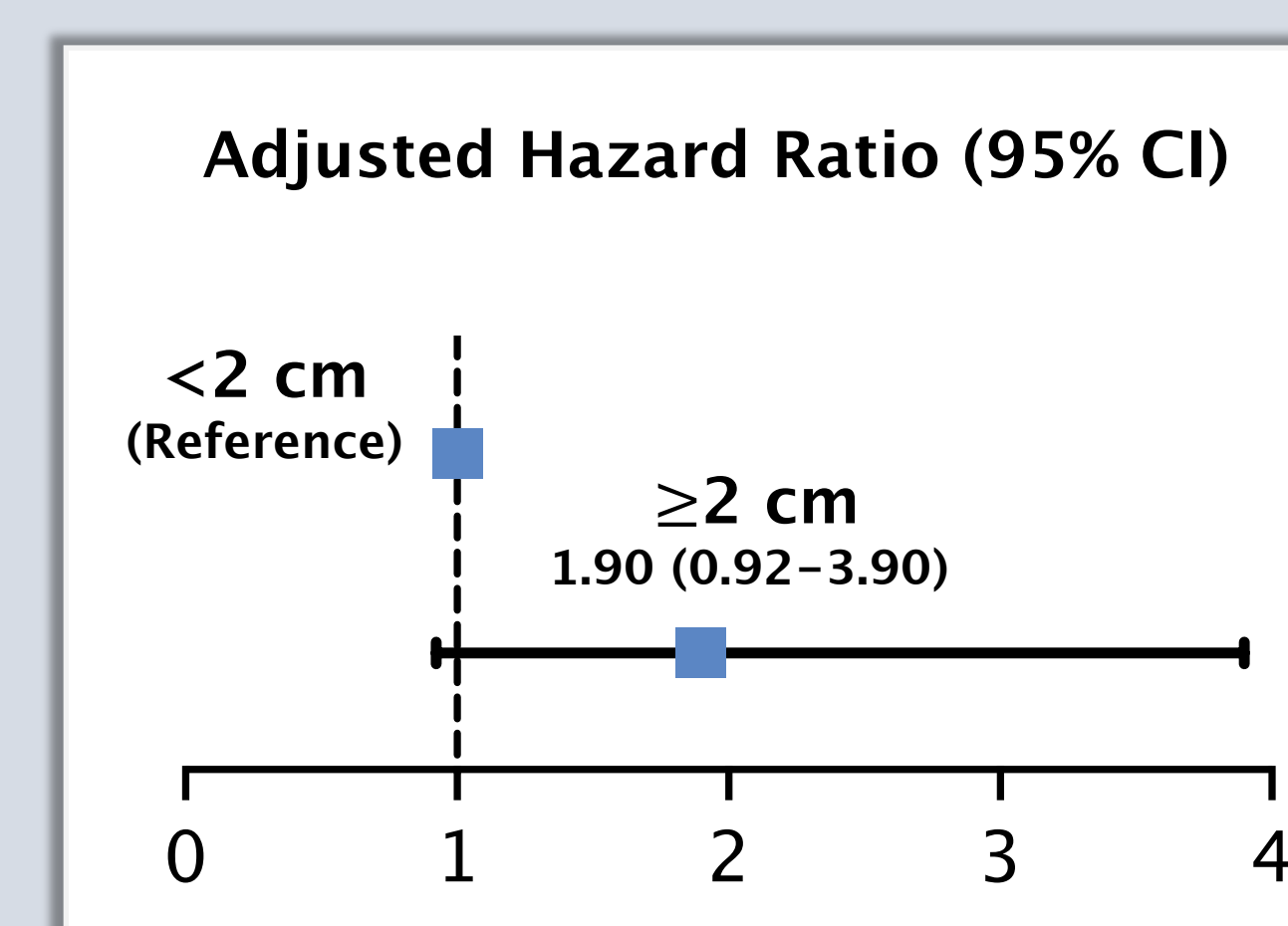
For pT4aNO oral cavity squamous cell carcinoma with invasion of the maxilla, decisions regarding post-operative radiotherapy should include consideration of tumor size. Our data indicate that **the survival benefit gained from PORT is limited to patients with larger tumors ≥2cm.** Further, tumors <2cm may be amenable to treatment de-escalation with single modality surgical therapy.

## Summary:

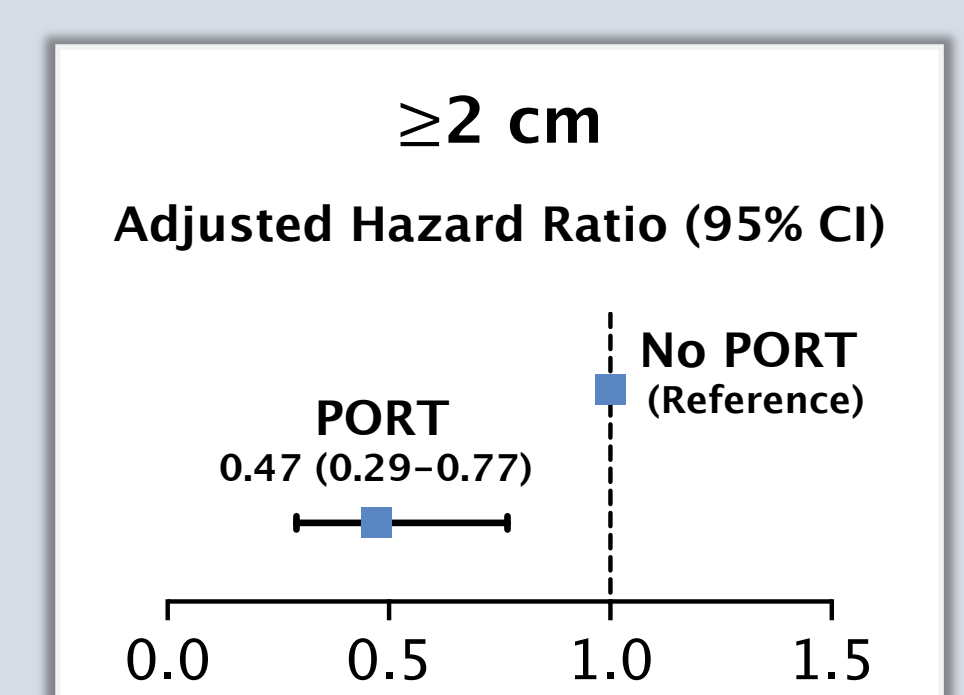
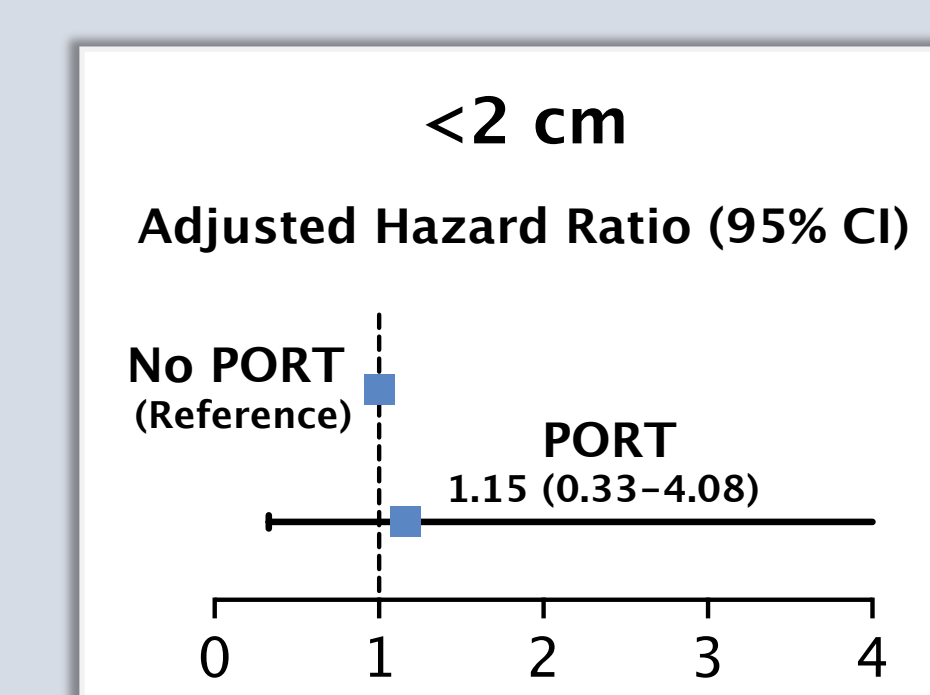
Overall radiotherapy improves survival for patients with pT4aNO oral cavity SCC requiring maxillectomy



Larger tumors show a trend towards worse survival, suggesting that not all T4aNO tumors are the same



When our cohort is stratified, we see that tumor size predicts response to post-operative radiotherapy



Only treatment of larger tumors significantly improves survival