

Local Extent of Tumor Predicts Outcome Over and Above the T Staging of Tongue Cancer: A Tool to Identify Aggressive Disease Within the Same T Stage

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INTRODUCTION:

Tongue cancers within the same T stage differ in prognosis. We aimed to (i) identify factors of local spread of disease that significantly impact outcome and (ii) make the current staging system more representative and accurate for tongue cancer.

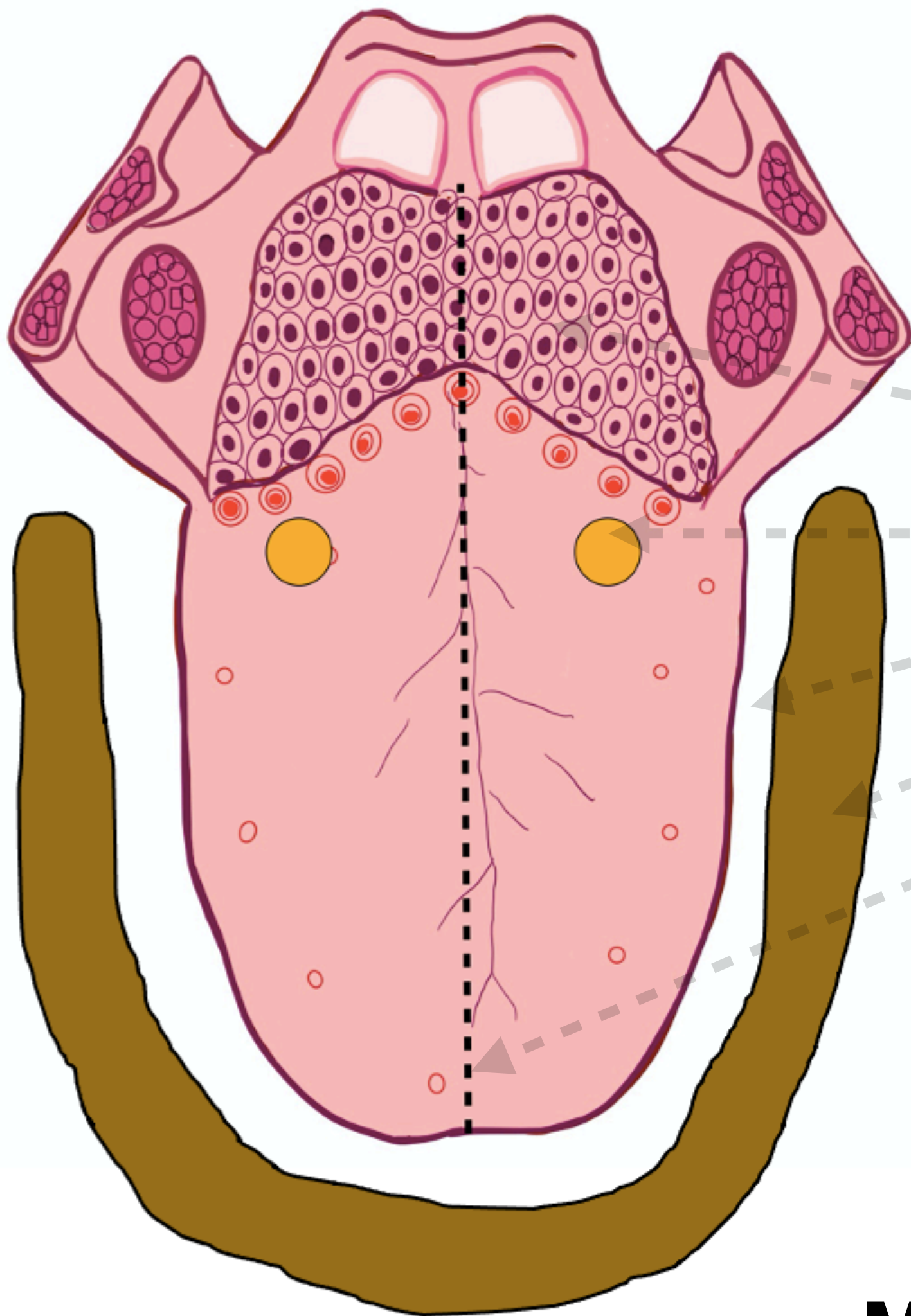


Figure: Factors considered for local extent of primary

- Base tongue
- Neurovascular bundle
- Floor of mouth
- Mandible
- Beyond the midline raphe
- Extrinsic muscles
- Sublingual gland
- Depth of invasion (DOI)

METHODS:

- Post-hoc analysis of 399 per primum oral tongue cancer operated between 2016-2018; data prospectively collected
- Surgery addressed primary tumor and unilateral or bilateral neck dissection, followed by risk-based adjuvant therapy
- Multivariate-analyses adjusted for pT, pN and adjuvant therapy and considered all factors of local extent of the primary tumor
- Using the significant variables, three candidate staging systems were developed and internally validated

RESULTS:

- Invasion onto base tongue ($p=0.021$), DOI >20mm ($p=0.040$) and tumor crossing the midline ($p=0.047$) significantly impacted the DSS

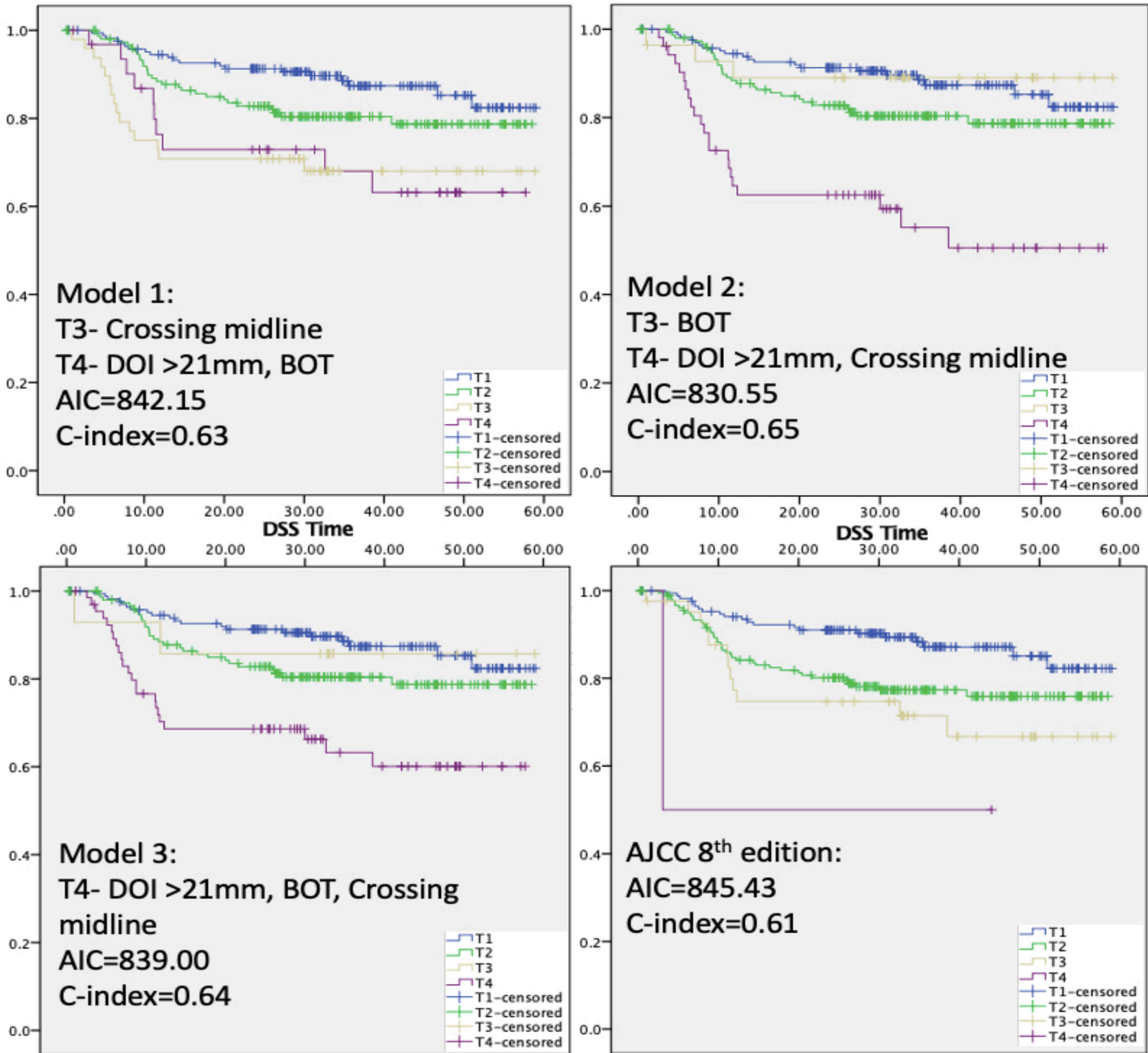


Figure: Kaplan-Meier curves for three candidate T classifications systems and AJCC 8th edition, based on Disease Specific Survival (DSS) at 32.3 months; Akaike Information Criterion (AIC), Harrel concordance index (C-index)

- **Model 1** = assume tumors locally infiltrate medially beyond the midline septum (M1,T3) before progressing posteriorly onto the embryological base tongue (M1,T4)
- **Model 2** = assume tumors spread through the entire hemi-tongue compartment, including posterior tongue, (M2,T3) and then cross natural barriers such as the midline septum (M2,T4)
- **Model 3** = all the adverse factors of significance into T4

- Compared to the AJCC 8th edition classification, the preferred staging system included
 - T3 = Invasion onto base tongue
 - T4 = DOI >20mm; Tumor crossing midline,
- based on lower AIC (AIC=830.55 vs 845.43), improved bootstrapped C-index (C-index=0.65 vs 0.61) and visual inspection of Kaplan-Meier curves

	Proposed staging system (T3- BOT; T4- DOI >21mm, crossing midline)			
AJCC 8 th ed.	T1	T2	T3	T4
T1	166 (96.5%)	0	4 (2.3%)	2 (1.2%)
T2	0	153 (83.6%)	6 (3.3%)	24 (13.1%)
T3	0	0	18 (42.9%)	24 (57.1%)
T4	0	0	0	2 (100%)

Table: Migration of stage from the current AJCC 8th edition based on proposed classification

CONCLUSION:

Clinical features specific to tongue cancers are underrepresented and need to be included in future updates of the advanced T classification of the AJCC staging system, to not only improve the prognosticative value, but also identify the aggressive tumors that require intensified treatments.