

Positive Margins Matter Regardless of Subsequent Resection Findings

Evan Ryan¹, Brendan Coutu², Dallin Christensen¹, Elizabeth Bradford Bell¹, Weining Zhen², Zafar Sayed¹

¹Department of Otolaryngology-Head & Neck Surgery, University of Nebraska Medical Center, Omaha, NE

²Department of Radiation Oncology, University of Nebraska Medical Center, Omaha, NE

Background

- Intraoperative positive margin communicated to the head and neck surgeon necessitates further resection of the area of identified involvement to achieve final negative margins.
- Final margin status impacts post-operative management and is strongly associated with outcomes.
- However, the prognostic impact of an initial positive margin when the final margin is negative is understudied.

Methods

- Patient population: Retrospective review of 249 patients with non-metastatic (Stage I-IVB) oral cavity squamous cell carcinoma (OCSCC) who underwent surgical resection from 2010-2019
- Clinicopathologic parameters: initial margin status, final margin status, size of primary disease, depth of invasion (DOI), perineural invasion (PNI), cortical bone invasion, extracapsular nodal extension (ECE), ECOG Performance Status
- Outcomes: Freedom from local recurrence (FFLR), disease-free survival (DFS), overall survival (OS)
- Statistical analysis: Chi-squared, Kaplan-Meier, Cox regression

Conclusions

- Initial positive surgical margins is independently associated with worse disease control and worse overall survival.
- Intraoperative positive surgical margins may be a surrogate for infiltrative disease as further malignancy on re-resection was also associated with worse outcomes.
- The role of intraoperative re-excision and post-operative management of patients with initial positive surgical margins are worthy of further investigation.

Results

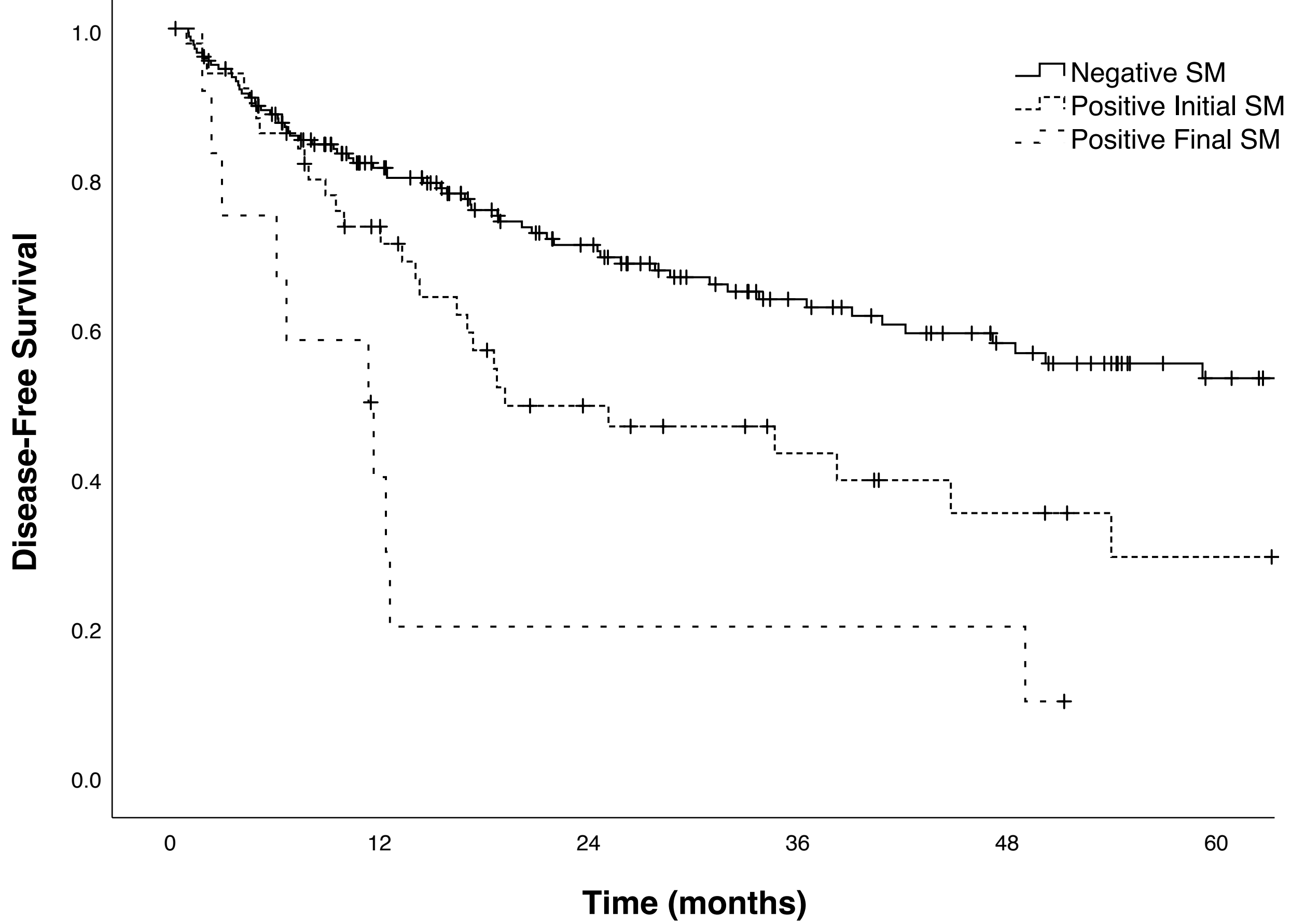
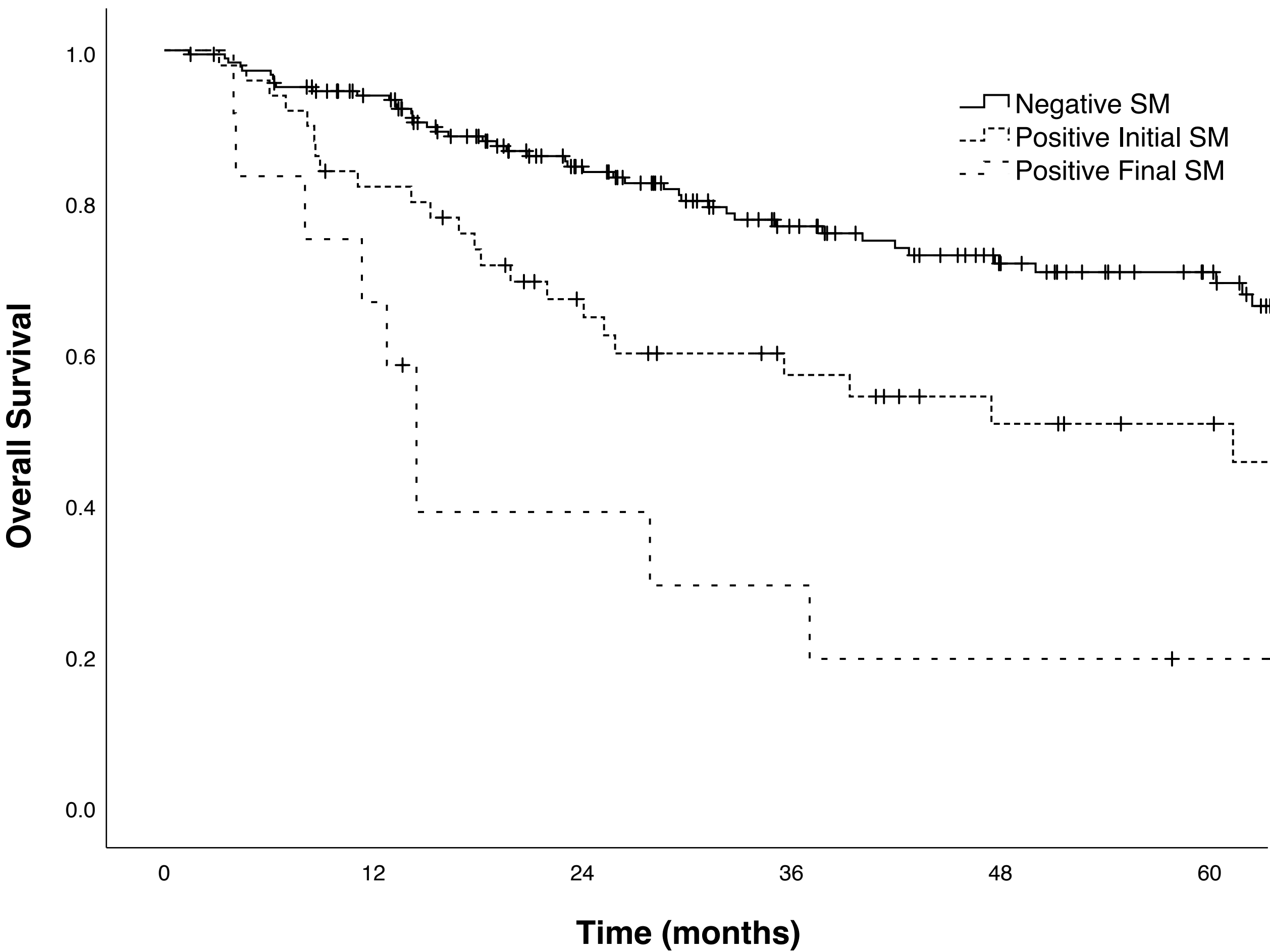
Table 1. Factors associated ($p<0.05$) with freedom from local recurrence (FFLR), disease-free survival (DFS), and overall survival (OS).

Characteristic	HR	95% CI	<i>P</i> -value
FFLR			
PNI	2.125	1.118-4.037	0.021
DOI ≥10 mm	2.216	1.170-4.200	0.015
Size ≥20 mm	2.252	1.168-4.343	0.015
Age ≥65	2.437	1.260-4.717	0.008
Positive initial margin	2.607	1.333-5.101	0.005
Cortical bone involvement	2.776	1.404-5.490	0.003
DFS			
Age ≥65	1.67	1.124-2.48	0.011
Positive initial margin	1.855	1.205-2.856	0.005
ECE	2.245	1.47-3.427	<0.001
DOI ≥10 mm	2.342	1.58-3.471	<0.001
Size ≥20 mm	2.671	1.774-4.02	<0.001
PNI	2.837	1.913-4.209	<0.001
ECOG PS ≥2	3.000	1.905-4.725	<0.001
OS			
Age ≥65	1.629	1.042-2.545	0.032
Cortical bone involvement	1.706	1.015-2.865	0.044
Positive initial margin	2.109	1.314-3.383	0.002
ECE	2.938	1.851-4.665	<0.001
DOI ≥10 mm	3.051	1.949-4.775	<0.001
Size ≥20 mm	3.455	2.142-5.575	<0.001
ECOG PS ≥2	3.456	2.077-5.751	<0.001
PNI	4.215	2.676-6.639	<0.001

Table 2 Associations between surgical margin involvement and other clinicopathologic parameters.

Characteristic	Negative SM (n=187)	Positive Initial SM (n=50)	Positive Final SM (n=12)	<i>P</i> -value
Age				0.449
<65	106 (56.7%)	28 (56%)	9 (75%)	
≥65	81 (43.3%)	22 (44%)	3 (25%)	
Gender				0.061
Male	105 (56.1%)	36 (72%)	5 (41.7%)	
Female	82 (43.9%)	14 (28%)	7 (58.3%)	
ECOG PS				0.860
<2	164 (87.7%)	43 (86%)	11 (91.7%)	
≥2	23 (12.3%)	7 (14%)	1 (8.3%)	
Smoking history				0.604
Non-smoker	40 (21.4%)	14 (28%)	3 (25%)	
Former or active smoker	147 (78.6%)	36 (72%)	9 (75%)	
Size of primary				0.001
≤20 mm	107 (57.2%)	16 (32%)	3 (25%)	
>20 mm	80 (42.8%)	34 (68%)	9 (75%)	
DOI				<0.001
≤10 mm	133 (71.1%)	22 (44%)	5 (41.7%)	
>10 mm	54 (28.9%)	28 (56%)	7 (58.3%)	
Grade				0.080
1	79 (42.2%)	15 (30%)	2 (16.7%)	
2-3	108 (57.8%)	35 (70%)	10 (83.3%)	
LVSI				0.081
Absent	173 (92.5%)	47 (94%)	9 (75%)	
Present	14 (7.5%)	3 (6%)	3 (25%)	
PNI				<0.001
Absent	137 (73.3%)	24 (48%)	5 (41.7%)	
Present	50 (26.7%)	26 (52%)	7 (58.3%)	
Cortical bone invasion				<0.001
Absent	164 (87.7%)	32 (64%)	6 (50%)	
Present	23 (12.3%)	18 (36%)	6 (50%)	
ECE				0.009
Absent	158 (84.5%)	39 (78%)	6 (50%)	
Present	29 (15.5%)	11 (22%)	6 (50%)	

Abbreviations: BMI, body mass index; ECOG PS, Eastern cooperative oncology group performance status; DOI, depth of invasion; LVSI, lymphovascular space invasion; PNI, perineural invasion; ECE, extracapsular extension.



Kaplan-Meier analyses associating overall survival and disease-free survival with margin status. Positive initial or final surgical margins are associated with worse survival outcomes (all $p<0.01$).